AUGUST 1940

FOOD INDUSTRIES

AUG 5

OMES OF FAMOUS FOODS...CHURCH & DWIGHT PLANT, SYRACUSE, N.Y.

IN THIS ISSUE:

The Trend of the Consumer Movement

Measuring Moisture in Vacuum Drying

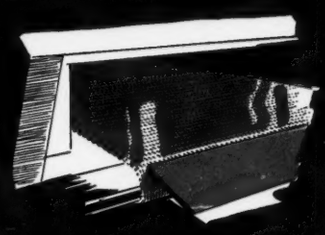
British Test Foods with Ultraviolet

New Wrapper Solves Problem for Packers

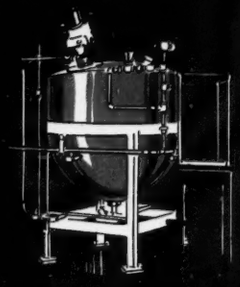
How to Make Commercially Sterile Foods

McGRAW-HILL PUBLISHING COMPANY, INC.

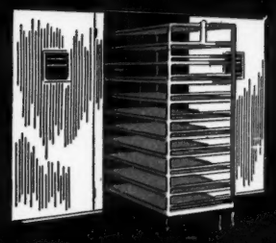
STAINLESS STEEL
assures sanitation in food processing



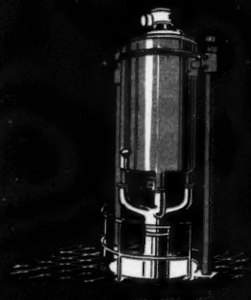
Stainless steel wire-cloth belt used in an oven at 550 degrees F. (above) and stainless steel mayonnaise lines (left).



Stainless steel cooking kettle for making chocolate syrup in a confectionery plant.



Stainless steel proof racks do not rust in the moisture laden atmosphere of the proof box.



Stainless steel coolers for storing pie fillings are not affected by the fruit acids.

STAINLESS steel is proving an ideal material for food processing equipment of all kinds. This smooth-surfaced, corrosion-resistant metal is bringing new standards of cleanliness and sanitation to the food industry. Bakers, confectioners, and other food producers will be interested in these advantages of stainless steel.

1. **Eliminates Contamination**—prevents metallic discoloration . . . guards taste . . . reduces spoilage.
2. **Assures Sanitation**—resistant to cleansers and sterilizers . . . smooth, polished surface reveals all dirt.
3. **Simplifies Maintenance**—resistant to acetic, lactic, and other food acids . . . rustproof and scratch-resistant.
4. **Prolongs Equipment Life**—withstands high temperatures . . . stainless throughout—no coating to chip or wear through.

Although we do not make stainless steel, we have for over 30 years produced "Electromet" ferro-alloys used in making stainless steel. With the knowledge accumulated from this experience, we are in a position to give you, without obligation, impartial assistance in the selection of a stainless steel for your particular problem. If you do not know the fabricators of stainless steel in your area, write us.

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★HOMES OF FAMOUS FOODS

On the cover is illustrated one of the most modern plants in the food industries—the new baking soda plant of Church & Dwight Co., Inc., Syracuse, N. Y. In this plant are made "Cow" and "Arm & Hammer" baking sodas. Additional views of the plant and information about it appear on pages 48 and 49.

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In THIS *Issue*

• STRAWS IN THE CONSUMER WIND

More testing facilities apparently will be made available to Consumers' Union through an arrangement with American Association of Scientific Workers. And CU will gain in prestige from this tie-up. These and other factors significant of a trend in the consumer movement are discussed on page 33. Ivan C. Miller, FOOD INDUSTRIES' distribution editor, comments on the proceedings of the recent annual meeting of CU.

• MAYBE YOU CAN DO IT

The British are able to tell all sorts of things about foods and food raw materials by the way they fluoresce under ultraviolet light. It seems that they have something there, especially since the method is simple and inexpensive. So turn to page 53 and let C. H. S. Tupholme of London tell you how the method is used on sugar, sirups, preserves, barley, eggs, artificial essence, flour, olive oil, butter, margarine, lard, coconut oil, cheese, fish and cocoa.

• KEEPS PROFITS FROM EVAPORATING

Packers have been praying these many years for a way to prevent moisture from evaporating from meat and reducing its weight and selling price. Now it looks as though their prayers have been answered by rubber hydrochloride, more generally called "Pliofilm." So effective is this packaging material that 30 packers are putting meat loaf into it. See the application of it illustrated and described on pages 42 to 44.

• FOR BETTER DEHYDRATION CONTROL

Nothing is more important to the success of a process than to know when to stop it. Which brings up a problem of drying. When the food in a vacuum dryer is nearing the proper moisture content, there isn't time to send a sample to the laboratory for moisture analysis. So there has been developed a quick mechanical method of estimating the moisture content. Anyone can use it. Harold E. Rue describes the method on pages 40 and 41.

• IT SHOULD BE DONE

Admittedly it's difficult to produce commercially sterile food products in all cases. But it should be done, if for no other reason than to meet competition better. Highly sanitary products keep their original flavor and quality longer. How to attain a high degree of sanitation in food processing is told by Dr. Paul S. Prickett and Nathan F. True, of the Bacteriological and Chemical Laboratories of Mead Johnson & Co. Pages 34 to 36.

In FORTHCOMING *Issues*

• IS THERE A TIN PROBLEM?

Some in government and in industry feel there is a possibility that international developments could bring about a shortage in tin, or cause it to go up in price. Others say there's no cause for concern. But it is important that executives of food companies be apprised of the situation if a problem really exists. So FOOD INDUSTRIES is making a study and will report its findings in an early issue.

• CONSUMERS DON'T LIKE IT

Some enlightening information on what the public thinks of food manufacturers was published in June. In September comes a sequel—what the public thinks of loss-leader selling. This will be told by Dickson Hartwell, who got his information from a door-to-door survey. By way of advance information, we can tip you off to the fact that the housewife doesn't approve of loss-leader selling. And the practice reflects unfavorably on the good name of the manufacturer of the loss-leader items.

• HANDLING THAT SAVES

Economy in a manufacturing plant can be made in many ways, but the most effective method is to design it into the plant before it is built. And in a modern, continuous-process plant, designing for economy means designing with materials-handling layout in mind from the first. The results in compactness—saving of original building space—and in power economy are results that must be engineered into the job. How one company obtained these economies is the subject of an article now in preparation.

• THERE'S A BETTER WAY

Although dry spices have been used these many years to impart the proper flavor to pickles, they are not the ideal flavoring agent. Why? Well, for one thing, they are quite variable in their flavoring intensity. Then, they have low solubility in brine. And, worse, they introduce foreign substances, such as mold and bacteria, which contribute to pickle spoilage. So, one way out is to use spice oils instead of dry spices. Arthur H. Downey, technical director, Magnus, Mabee & Reynard, Inc., New York, will tell all about it in a forthcoming article.

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The Talk of the Industry

» THE EASIEST WAY to arouse the ire of a food manufacturer last autumn when Word War II was beginning was to ask him if he was receiving any inquiries for export shipment to the Allies. Sometimes the flareup was fearful to behold. Today the situation is quite different. Nearly everyone is expectantly waiting. How public opinion does change!

» HAY FEVER BREAD, hay fever beer, hay fever grape juice or hay fever wine is proposed as the latest remedy for this respiratory allergy, according to a recent U.S. patent, No. 2,207,415. By putting the offending pollen into fermenting yeast and then incorporating this into the food, which is then consumed, the hay fever sufferer is expected to eat his way to relief in short order.

We hope it will work out according to the patent specifications, but one

question keeps coming up. If eating the offending protein will prevent hay fever, why should anyone ever be sensitive to other substances that are normally eaten?

» IT'S GOOD NEWS to learn that the government plans to revise our federal income tax laws so as to permit rapid write-off of new plants and equipment devoted to munitions production.

A similar extension of policy for food manufacturers should also be in order, if many are forced to adopt new methods of food preservation as a result of inability to procure needed supplies or to comply with government orders.

» THERE ARE A FEW MEN in the food industries who are of the opinion that matters political are of no concern to them, and they likewise seem to believe that any sound and sane discussion of the economic future of the food business can omit all political factors. In fact, some of them fiercely resent defiling of these pages with any reference to those powerful forces that are at work in any democracy, even good old U.S.A.

Sensitive as editors must always be to the desires of their readers, it is impossible to ignore the political possibilities of the future. Business, even the essential food industry, does not operate in a political vacuum, even though most business men would naturally prefer things that way.

Many of our biggest problems in this country have arisen as a direct result of a previous lack of interest in politics—meaning the art of government—on the part of business leaders. It is a fundamental principle of democracy that economic problems of the masses soon become political problems of the nation. That principle will hold as long as people have the right to vote. The CIO, WPA, PWA, AAA, Farm Relief, FSCA, Blue and Orange Stamps and all the alphabetical agencies bear ample testimony to the validity of that principle.

You may disagree with us as to the best policy to pursue in the art of government. That is your right. But no man has any moral right to evade his own political responsibilities or to encourage others to evade theirs.

» Two alleged new uses for refrigeration arouse our curiosity. One of these is cold storage of green hay.

Feeding tests are stated to show that it is better than dehydrated hay, which heretofore has been rated tops in animal fodder. The other is cold storage for aluminum rivets. We can't quite figure that one out.

» SALE OF LECITHIN is a seven-firm monopoly, according to the Federal Trade Commission. Five American firms, one German and a Danish concern are cited as respondents. What interests most, however, is the FTC statement that lecithin is a "chemical" and that it is used for making paints, petroleum, rubber, leather, waxes and other products in addition to its better known uses in candy, oils, fats and crackers.

When is a food not a food? When it is a chemical.

Never Stop Selling

OVERLY optimistic persons in charge of many business enterprises now operating at maximum capacity are adopting an unwise policy. These optimists are relaxing their selling efforts because sale of their goods is very easy at the present time.

Why is this unwise? Go back to the delirious years of 1915–19, when sellers' markets prevailed. Salesmen were merely order-takers, and frequently they avoided calling on customers whose insistent demands could not be filled. Sometimes it was safer to keep out of the customer's office than to try to placate him for failure to deliver the goods on order or to refuse to accept orders which he thrust upon salesmen.

Wisely managed concerns kept their heads in those days. They knew that a change would come, as it finally did in 1920. They adapted their policies to the ultimate and inevitable period of readjustment that experienced men knew would follow the war boom. They did not neglect their old customers, nor did they forget for one moment that the day would surely come when customers had to be *sold*—not merely permitted to order goods.

When the war boom was over those who had been wise and had taken the long view did not lose their shirts nor their customers. Those who had forgotten how to sell found that it was extremely difficult to get started again. Precious years had been lost that could not be recaptured. And many a concern that was once a leader fell to a secondary status or even worse. One company that was once preeminent in its field has never again regained its place despite reorganization, recapitalization and 20 years of effort.

Selling effort must never let up, no matter how easy it is to get orders today. As long as the government continues to consider sales promotion as a legitimate cost of doing business, there should be no let-up in this activity. Selling, sales promotion and advertising always cost money, but it is easier to spend it when the money is on hand than when it is scarce.

Properly planned and executed sales promotion activities can create a good reputation for a company and its goods—a reputation that cannot be taken away in hard times.

A company can invest a part of its available funds wisely in sales promotion and obtain an enduring reward of prestige, or it can pay it out in big taxes and small dividends. But prestige does not quickly disappear when orders are hard to get. You have to go through a complete cycle of good and hard times to really learn the value of high prestige and a well-advertised name.

Business Will Be Good

ANY FEARS that the collapse of France or the possible defeat of Great Britain will have an immediate adverse effect on business in the United States are groundless.

The rearmament program now slowly getting under way will produce a volume of business at a very high level until at least the end of 1941, which is just about as far as one can see ahead today.

Government spending is at as rapid a rate as it is possible to spend. It differs from WPA and other relief spending of the lamented past in one very important respect. In the early New Deal days, the emphasis was on the erroneous theory that to put money into consumers' hands, regardless of the result obtained in the exchange, would restore prosperity. Under rearmament spending the emphasis is on the net result. And there is no doubt that this latter form of spending will really restore employment to gratifying figures.

Better Buy Before the Rush Begins

DURING a lengthy journey through the Midwest we were amazed to hear many citizens of that area accusing the easterners of trying to start a war. When one is a thousand miles from the seaboard, the troubles in Europe do seem very far away—almost as remote as a bad dream dimly recollected.

The sense of awareness of the impact of events abroad travels overland at a very slow rate. Radio, newspapers and magazines appear not to influence its speed at all. Starting from either the eastern or western seaboard, this sense of awareness takes from a year to a year and a half to cross the continent.

The East is not trying to start a war; it is only very conscious of the potential hazards ahead if the British fleet should fall into Hitler's power. The Midwest will reach the same consciousness of this hazard about the middle of September.

In the meantime, industrial executives must not lose any precious hours in their part of national armament

Hors d'Oeuvres

• *Fifteen years ago only a few thousand cases of canned dog and cat food was marketed. But sales as revealed by the 1937 Census of Manufacturers had a value of $20,000,000, while dog biscuit and dried pet food totaled more than $7,000,000 in value. A howling success, what?*

• It takes 10½ quarts of milk to make a pound of butter. If farmers received a class 1 price for this milk, say 6 cents a quart, the housewife would have to pay about 73 cents for a pound of butter. So its just a case of which the housewife likes the better, the farmer or the butter.

• *Pectin therapy is the newest wrinkle in medicine. It seems that the jelling ingredient of jam has definite healing properties. When little Willie hears about this he's going to "develop" an awfully sore tongue.*

• Germany has perfected a tinless can for food. Formed from steel by automatic welding, the container is coated with enamel. Now all der Fuehrer needs is some food to put into it.

• *The New Hampshire state highway department cuts the bottoms from empty beer cans and nails them on snow fences as reflectors to guide motorists. This keeps drivers from doing a bottoms-up during a snowstorm.*

• Mammy's Barbecued Peanut Co., Inc., has been formed at Dallas, Tex. Apparently there is more than one way to roast a nut.

• *Fresh fruit is now sent by wire in a business engaged in by more than 900 retailers in 48 states. So you can send peaches to your wife, crab apples to your mother-in-law and persimmons to your Aunt Maggie.*

• From Richmond, Va., comes news of a slump in the crab business. But Richmond is not alone. Conditions all over are so bad that people have had to quit crabbing and do something about it.

• *Superior Macaroni Co., Los Angeles, has introduced "Kol-Pop," a carbonated beverage. Maybe this provides a new outlet for macaroni straws.*

• A "Love Insurance Policy" is offered to customers by the Herz Candy Co., St. Louis. On the policy are listed the birthday, anniversary and other dates when the beneficiary is to receive a box of candy. This would have been a swell system for Solomon.

• *Brazil will construct a plant to make a plastic, cafelite, from coffee. And now that planes are about to be moulded from plastic, "coffee cans" may become something that you fly.*

F.K.L.

just because they may not be quite fully aware that there is a first-class war only twelve hours away.

The national defense program has not even gotten started yet, but already signs of car shortages are beginning to develop. Already big steel companies are beginning to ration a few of their customers. All this is occurring when things haven't yet started really moving. What will it be like a year hence?

If your plant needs any equipment or supplies, they should be purchased now. Don't wait for the day when your order may be far down on some priority list and you may have to wait months for delivery.

The food manufacturer's part in national defense is to be ready to produce, preserve and deliver foods and to anticipate his needs and methods well in advance. The idea is to be *ready*. When the real rush on munitions gets going it will not be so easy to get ready.

Build Up Your Coal Pile

HEAVY DEMAND for use of gondola cars on railroads for transportation of products other than coal is likely to create a situation next winter that may make it difficult to get coal as needed.

Prudent management will keep its coal stocks at capacity so that if a car shortage should develop there will be no need for emergency deliveries by trucks. Though there is no present cause for alarm, it should be realized that in certain steel-producing areas the railroads are using these cars up to the limit right now. If coal should ever become difficult to get, it will be due to car shortage, not to inability of the mines to produce.

These Added Costs Should Be Reduced

THE MOST COMMON COMPLAINT throughout the food industry is the appalling increase in the costs of doing business because of the enormous volume of records that must now be kept as a result of New Deal legislation. If the coming national election can bring in a federal administration that will be sympathetic with business troubles, and will eliminate the enormous wastes that now exist, it will be a step toward prosperity.

Examples of these wastes abound on every hand. For instance, a one-man consulting business employing two young ladies is forced to render 53 separate reports annually to various governmental agencies.

A small flour mill has had to build an extra office room, 10x24 ft. in size, to accommodate the visiting government auditors and accountants. It also bought an adding machine for their use so that the business itself could proceed in spite of their presence.

A small canner employing only one person in the office beside the owner was so harassed by repeated inspections, audits and efforts to incriminate him in some violation of the multiplicity of laws and regulations that he saw red, and exploded:

"Listen, you birds. Those two filing cases and those two books contain all the records this business ever had since I have owned it. The law gives you the right to go over all my affairs, so help yourself. But if you don't put every paper back exactly where it came from I'll give you the worst drubbing you ever had. And I'll do it, if I spend the rest of my life in jail. What? Where can you sit? Sit on the floor, or stand up and work on top of the filing cases. This business has got to go on so that I can earn enough tax money to pay your salaries." (The pair of auditors did not stay more than 30 minutes longer.)

One of the larger food manufacturing companies has been forced to increase its insurance department from three persons to forty merely to handle the voluminous social insurance reports.

Such examples could be related endlessly. The federal government needs to undergo a change of heart and repeal some laws and modify procedure under others. Business, which is the backbone of the economics of the United States, needs to be helped, not discouraged.

Conquest of France— A Failure to Keep Up-to-date

THE AWFUL TRAGEDY of the conquest of France is the direct result of failure to conduct adequate researches into the art of national defense. That failure and its causes should be branded with fire on the memory of every executive and any one who ever hopes to become an executive.

Why France failed to continue its researches into the art of defense or of war, it is not necessary to consider here. The main fact is that it built a huge "factory", called the Maginot Line, based on old ways of doing things. And then an enemy with new inventions, new equipment and new methods made the French defenses obsolete.

Though we, from our safe observation point in the U.S., may regard this tragedy as appalling, we should remember that in a smaller way the obsolescence of the French military machine is being duplicated in hundreds of American food businesses.

A recent field survey indicates too much trusting complacency with current methods and old equipment. Substitute the name of many a business for France (or Britain) and the name of an aggressive competitor for Germany and you have a set of domestic industrial conditions that parallel the Allied false sense of security up to the invasion of Norway and Denmark.

In this day of frightening changes the only real self defense of business, like that of nations, is research. If you feel content with today's ways and today's equipment or today's products, you are almost sure to meet competition from a research-minded competitor who, like Germany, has something new and different against which you may have no defense at all except cut prices and financial losses.

Aggressive research, well directed, is the price you must pay to stay in business in this day of rapid changes. Get started in research, keep at it, and make up your mind to keep at it forever, from now on.

Pectin No Longer Declared

PECTIN may be added to preserves, jelly and fruit butters without label declaration if the findings of fact and proposed definitions and standards of identity for these products, published in the *Federal Register*, June 25, 1940, are given final and official approval. And there is no reason to believe they will not be approved.

This proposed ruling may perhaps cause consumers, professional and otherwise, some surprise and misunderstanding. But it is not a letdown in regulatory standards of the Food and Drug Administration. On the contrary, it is a commendable application of common sense and science.

At the public hearings on the standards for preserves it was made very clear that good preserves and jellies require a certain normal content of pectin. Housewives face the identical problem when their jellies will not "jell." It is nothing new to food technologists nor to the preserving industry.

Approximately 20 years ago, Herbert T. Leo, addressing the Duluth convention of the Dairy, Food and Drug Control Officials of the United States, proved by evidence and irrefutable logic that a jelly was composed of acid, sugar and pectin in

suitable proportions in water. Omit any one of the ingredients and there is no jelly. If the pectin is not there, it won't jell. There can be no such thing as an "artificial" jelly by the mere addition of a missing ingredient.

Pectin content of fruit is largest when the fruit is slightly underripe. When fruit is fully ripe and has its best flavor, the pectin has begun to disappear. Ideally, the preserver would buy only fruit of the proper pectin content irrespective of flavor, rejecting the luscious dead-ripe fruit of low pectin content. Yet to do so would be to reject much very valuable raw material, probably also making it unavailable for any other commercial use. It would be so ripe that nobody could use it commercially.

The alternative is simple. The preserver needs only to add pectin in such quantity as will raise the batch up to the natural jelling consistency. Thus scientific control compensates for nature's vagaries. The Food and Drug Administration very wisely goes along with this corrective plan.

It does *not* permit excess pectin above normal.

It does not encourage low-quality preserves, jellies or fruit butters. It simply recognizes the practical limitations of nature's fruit supply.

Moreover, the new regulations encourage, almost require, that the preserver make a first-class product. The lower limit on total soluble solids (68 or 65 percent depending on which fruit is employed) does this, because it practically forbids excess water content in the finished product.

Many divisions of the food industry will welcome this evidence of constructive cooperation of officials in meeting the very practical difficulties of food manufacture. The Food and Drug Administration is to be commended for raising the standards of performance to be expected in the preserve industry, for under these new standards any tendency to stray from the straight and narrow path will be disastrous.

Is Bare Iron Good or Bad?

A FRIEND who has had much experience in the uses of essential oils states that of all the metals he knows anything about there are only two that are safe to use where any contact with the oils is permitted.

These safe metals are silver and tin. All others ruin the flavor of essential oils in a surprisingly short time. In some cases the flavor loss is complete in an overnight contact. Iron and copper are particularly active in bringing about such flavor losses.

The matter was brought out in connection with discussions of changes of flavor and color of bread as a result of mechanical mixing. "Could it be possible," he asked, "that the very delicate 'homemade' flavor of bread could be lost through contact with bare iron in the mixers? If iron will change the powerful flavors of essential oils in a few hours, what might it do to the very mild flavors of bread?"

There is an old household tradition in New England that tends to substantiate this hypothesis. This tradition is that good bread can be made only by mixing in a wooden bowl by means of a wooden spoon. No metal may touch the dough.

In Europe the same tradition exists among the housewives of certain countries that are famous for good foods.

The possible effect of iron on flavors appears to be a subject deserving of careful investigation, for bakers, meat packers, macaroni and noodle makers, chocolate makers and many candy manufacturers are generous users of bare iron equipment. Perhaps here is a case parallel to the evils of minute traces of copper in pickles, where as little as 1.5 parts of copper per million can affect the color and contribute a harsh flavor. Ice cream, too, appears to have a similar critical tolerance of 3 parts per million of copper.

We believe that several investigations of the possible adverse effect of bare iron would be in order.

Suspending the Wolf Awards

NO IRWIN D. WOLF AWARDS for distinctive merit in packaging will be made in 1941, according to an announcement from American Management Association. The reason given indicates that the sponsors of the awards believe that a study should be made of the whole situation for the purpose of ascertaining a more vital basis for signalizing outstanding merit, be it for the protective or for the merchandising function.

Anyone who has paid close attention to this and other systems of packaging awards must concede that, because of the diverse and complex character of the multitude of aspects of packaging, any attempt at fairness and impartiality at once leads to such a multiplicity of awards and honorable mentions as to deprive the recipients of very much distinction. Furthermore, creation of a meritorious package involves the cooperation of so many persons that awarding of credit must be done on a wholesale basis. And, because packaging has so greatly improved in the past nine years, it has now reached a rather high plateau of achievement. It is clearly desirable that a new basis of awarding merit should be sought.

Students of current events will realize that the possible economic and supply problems of the near future may provide the desired basis of a new type of packaging award. For the world-shaking events that have transpired, plus those for which the nation is actively preparing and those which may occur in 1941, can easily change the whole complexion of our civil and business lives—and may bring about significant changes even in packaging.

Hence we suggest that "preparedness packaging" may deserve serious consideration as a basis for future awards.

Where Research Pays Big Dividends

MORE THAN 400 research projects were completed in 1939 by the research and development department of one of the large food companies. The money saved or gained by four of those projects paid the entire cost of the research program for the year.

The head of research of another concern has informed us that his department has not come even close to 400 finished jobs for the past year. But, he added, one single job just completed by his company will repay the entire research cost since the department was inaugurated many years ago.

The remarkable results like the foregoing are achieved only by steady, intelligent plugging, year after year. If research is to be a profitable investment, it must be made a continuing activity. Furthermore, it takes several years of hard work to even begin to show results. But it pays.

Notice to Formula Seekers

NOW that FOOD INDUSTRIES is publishing formulas for manufactured foods, a veritable deluge of requests for formulas is coming in. We shall do what we can to supply the requests, but we cannot stop all work for this particular purpose.

And may we remind the cash customers that formulas do not come out of thin air. They must be procured from some source, one which we believe to be reliable and may perchance be located in another country. Many months may be required to get what you want if, indeed, we can get it at all.

When a formula is easy to get, it seems that nobody wants it. When a formula is impossible to get, we find that nearly everybody wants it.

Consumers' Union Takes an Ally

Support of scientific group, announced at annual meeting, indicates trend

By IVAN C. MILLER
Distribution Editor
FOOD INDUSTRIES

AT its annual meeting this year, Consumers' Union announced the support of American Association of Scientific Workers, which organization plans to establish consumer goods standards and provide CU with the results of consumer goods testing. Significant is the fact that the 1940 meeting of CU at Massachusetts State College, Amherst, was co-sponsored by AASW. In addition to this fact, the viewpoints expressed at the meeting, by both CU and AASW members, indicating the thinking of several units of the consumer movement, are important to food manufacturers.

The general attitudes of those who addressed the various sessions and those who raised questions or volunteered statements *seemed* to be the result of a sincere though zealous and crusading determination to obtain a more "adequate and satisfactory standard of living for the entire citizenry of the country, especially for those of the lower half."

The general attitude was not beiligerent—rather confident. Little was said (unless at closed, private gatherings) to which business could take exception. The accusations and condemnations which have characterized the past addresses of some of the same speakers when speaking before women's groups and forums were conspicuously omitted.

The principal attitude appeared to be directed toward entrenchment or consolidation of gains rather than aggressive attack. Throughout the meetings there seemed to be an air of confidence born at least of accomplishment if not complete success.

The opening remark of Dr. Paul G. Agnew, Secretary of the American Standards Association, is probably indicative of the thinking of the conservative element in the consumer movement and probably of many members of Consumers' Union. Dr. Agnew pointed out that any great movement advanced in three stages. The first stage is marked by antagonism and name-calling of those in opposition. The second stage is characterized by recognition of opposition values and discussion of cooperation and means of obtaining cooperation between opposing elements. In the third stage, adjustments and reforms are introduced on both sides, and actual cooperation is accomplished. According to Dr. Agnew, the consumers' movement is now entering the second stage.

CU's closed-session business meeting (much like any stockholders' meeting) smacked of corporate enterprise, even though Consumers' Union is a nonprofit organization. The importance of advertising was stressed with the statement that the present expenditure of approximately $40,000, mostly for direct-mail promotion, would be increased to at least $100,000 immediately if Consumers' Union could gain access to the advertising pages of newspapers and general media. It is significant that the present expenditure for promotion of $40,000 is approximately 17 percent of the earned income, approximately equal to testing expense and more than double editorial costs.

Several times during the sessions and also in the business meeting it was admitted that the Consumers' Union membership had not increased but remained static at 85,000 during the past year. Compensating gains were reported which more than offset the lack of increased membership. Four of these are important:

Organized consumers and business ready to cooperate—maybe!

1. Consumers' Union admitted that testing facilities were inadequate, that at times reports were based on unsupported opinion, and that mistakes had been made in spite of honest intent. The future promises expanded and more adequate facilities for accurate testing as a result of affiliation with the American Association of Scientific Workers. This rapidly growing association with a membership of more than 800 has, as one of its activities, set up a committee "to furnish technical advice to consumers organizations, and to make arrangements for scientific testing of certain products." Consumers' Union expects ample testing service from American Association of Scientific Workers—free, or at least at minimum cost, and the establishment of standards based on service and use. American Association of Scientific Workers proposes to provide these services. Consumer's Union hopes this access to testing service will answer charges criticizing CU's inadequate facilities. And affiliation with this association will unquestionably lend prestige to CU.

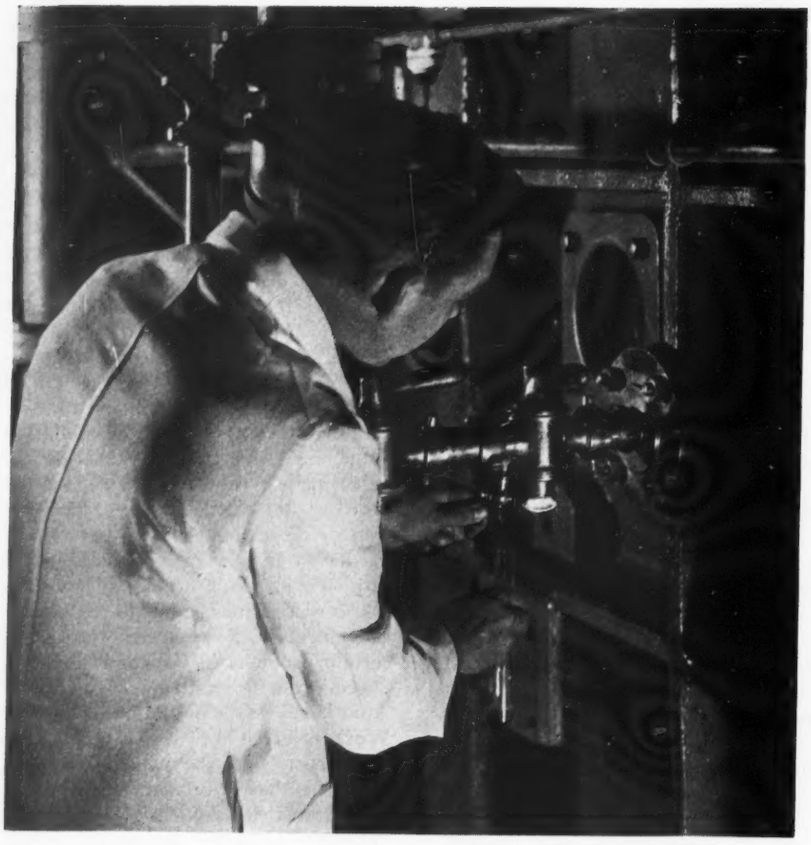
2. Consumers' Union has sold many study-group subscriptions to labor unions, thus penetrating a portion of the lower income group. Also, Consumers' Union has succeeded in selling many study-group memberships in schools and colleges. Consumers' Union adherents appear certain that courses in "consumer education" (curriculum not yet uniform nor established) will be included in the course of study (required) throughout our educational system from the lower grades through college.

3. Consumers' Union is confident of increased support from such groups as AAUW and League of Women Voters.

4. Consumers' Union adherents consider Harriet Eliott's appointment as representative of consumer interests on the President's advisory committee on national defense a star in their crown and a move which will definitely advance the consumer cause.

It was the general opinion of those gathered at Amherst that industrial mobilization, increased taxes and other results of the present emergency will stimulate activities of and interest

(Turn to page 73)



Sampling during manufacturing for bacteriological testing.

This is an article about
QUALITY CONTROL

It is of value to
All Food Manufacturers

Because it outlines the practical steps necessary in plant operation to obtain a highly sanitary product. And, if for no other reason, this is important in meeting competition.—The Editors.

KEEPING OUT THE BACTERIA

How to produce foods of high sanitary quality

HOW to produce a sterile food or one that is very low in bacterial count is simple in principle—merely keep the bacteria out. But how to keep the bacteria out is a very difficult problem.

What are the steps by which a manufacturer can produce foods of high sanitary quality? They are in reality very few and very simple—start with clean raw materials; keep them clean during the manufacturing processes; pack the finished product cleanly and in suitable containers. It is the practical application of these simple rules that is frequently difficult.

To apply these rules satisfactorily, the manufacturer needs an adequate knowledge and understanding of his problems and the factors controlling them. If his own laboratory facilities are unable to supply such data and information, a consulting laboratory, his trade association or his state experiment station is available.

By
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and
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The manufacturing process must be surveyed bacteriologically step by step from raw materials to the packed product to find where and how sanitary control measures must be used.

Many raw materials are now bought by food manufacturers subject to chemical and physical specifications; microbiological specifications are likewise essential for certain types of raw materials and desirable for many. Interpretation and practical use of the data secured by a bacteriological survey of the raw food materials are based on several factors, the more important of which are: (1) The physical condition of the raw material, whether it is liquid or solid, moist or dry, and so forth, and what effect these conditions will have on bacterial growth. (2) The chemical properties, whether it is available as food for microorganisms, is acid or neutral, and so forth. (3) The conditions under which it is to be stored and the effect of this on microbial growth. (4) The manner or method of treatment which the material will undergo, both immediately and ultimately, in the manufacturing processes.

In the manufacturing processes the survey will likely disclose that certain steps cause a bacterial decrease, as, for example, where boiling hot water is used for dissolving a raw material or where it is heated in the presence of water under steam pressure. Other steps will offer favorable conditions for bacterial growth, such as preevaporating hot wells or low temperature, continuously used pasteurizers or vacuum pans or dryers.

Practical application of the survey's data to the control of bacterial growth during the manufacturing process is one of the difficulties referred to. Adequate knowledge of the types of organisms involved and the conditions governing their growth is essential in planning any changes to control such growth. A variety of factors are involved, such as temperature-time relationships, pH, concentration of solids in solution, homogeneity of liquids and bacterial content of air and of various raw ingredients. For example, the temperature-time rela-

tionships that are inimical to mesophilic bacteria may prove extremely favorable to thermophilic types.

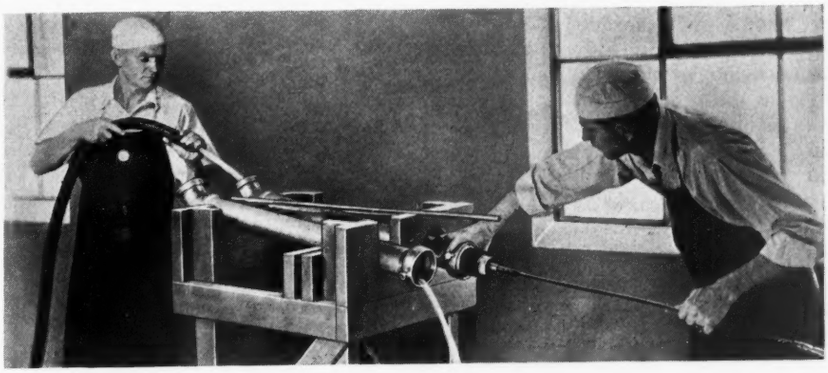
Comparatively minor changes, like rearrangement of piping, eliminating "pockets" and dead-ends, readjusting certain temperature-time relationships, strict control of pH and adding a raw material earlier or later in the process or in another form frequently will be sufficient to change conditions favoring bacterial increase to those favoring their decrease. At times, relatively major alterations or actual changing of equipment may be necessary to achieve adequate sanitary control. Costly mistakes can be avoided almost entirely by laboratory investigation and proper interpretation of the data so obtbained.

In conjunction with studying the manufacturing processes, in fact as an integral part of the study, the testing of various cleaning and sterilizing methods for the equipment is necessary. What would it profit a food manufacturer to rearrange his process to control bacterial growth, obtain microbiologically clean raw materials and then use dirty or contaminated equipment?

Cleasing agents and detergents are very frequently helpful and often necessary in cleaning the manufacturing equipment. Many such products are available, some for general, all-purpose cleansing and others for special jobs. But the one essential ingredient common to all cleaning jobs, without which the best and highest price cleansers fail, is "elbow grease." A large proportion of this ingredient in a simple detergent, plus scrub brushes of proper design, plus copious amounts of hot water, will be found adequate for most cleaning jobs. Dirt can be sterilized—but it is still dirt. Moreover, greater quantities of the sterilizing agent are required to sterilize equipment which is dirty.

For sterilizing the equipment, two practical agents, heat and chemicals, are available to the food manufacturer. Each method has its advantages and disadvantages. Hot water can be used, but steam is preferable as it is faster and more positive. With open equipment, or that which will not stand pressure, or where steam is not available or practical, chemical sterilization is preferable. The well known hypochlorites have proved to be quite satisfactory in this field.

When steam is used, properly placed steam inlets, valves for air elimination and removal of condensed water, safety valves and pressure gages are all essential for complete sterilization. Dead-ends and pockets must be avoided. Smaller pieces of equipment, impractical to steam in place, can be steamed in large, simple autoclaves or pressure steamers. To facilitate handling and eliminate contamination, chain hoists on overhead tracks can be used and the workmen supplied with clean asbestos gloves so that the autoclaved equipment can be handled



Washing small, movable equipment (sanitary pipe in this instance) before sterilizing it in an autoclave.

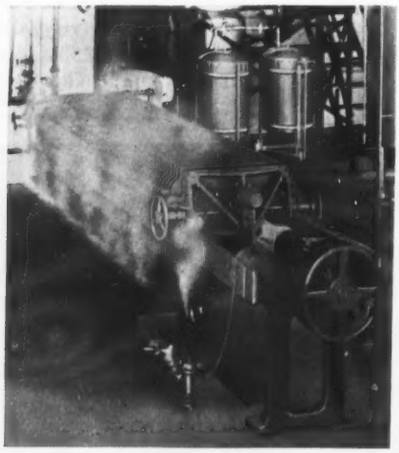
Mechanical cleaning of interior of a tank prior to steam sterilization. Note water hose coming through open manhole.

Preparing to sterilize the cleaned, smaller, movable pieces of equipment in an autoclave. Note asbestos gloves of workman.

while still hot. If the steam pressure is released rapidly, the equipment is fairly dry when it is removed from the autoclave, and similar results are obtained with the large equipment that is steamed in place.

The question naturally arises: How much time is required for cleaning and sterilizing procedures? Naturally this will vary from one department to another, depending on such factors as the type of product produced, the equipment used and the manufacturing process; it will likewise vary between divisions or different operations in the same department. A sanitary program does not necessarily require an increased number of employees, but it does mean that the production schedule and the employee's time and work are so arranged that his share of the cleaning and sterilizing procedures are an integral part of his work.

Not only must suitable containers be used for packing the finished, clean product, but the containers themselves must also be clean both physically and bacteriologically. This involves proper storage, inspection and, if necessary, cleaning of the containers. Sanitary quarters and equipment for packing are likewise requisites.



After cleaning, washing and reassembling, the filter press is sterilized with steam under pressure. Connecting pipe lines are being sterilized simultaneously.

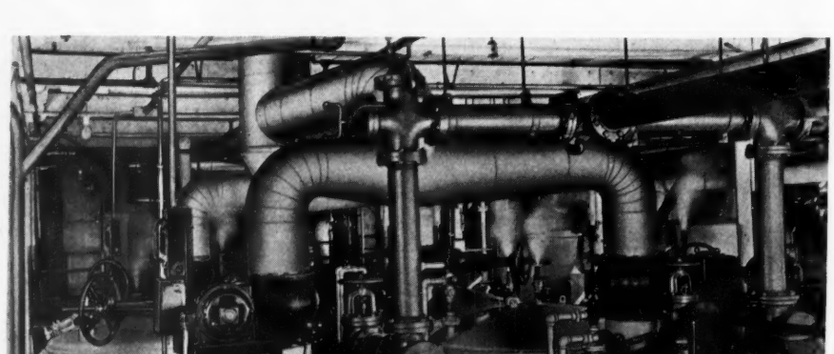
The most important factor of all is the human factor. Hence, not the least of a manufacturer's efforts needs to be the education and training of his production personnel. Just as this factor is ever present, so must be the education, training and supervision. Thought and effort expended to devise more convenient ways for the operating personnel to perform the various cleaning and sterilizing operations return big dividends in cooperation and results. The psychological laws relating to environmental influence can be put to work with excellent results in all phases of a sanitary control program. The foreman in charge of each department should be responsible for the cleaning and sterilizing procedures in his department and, in turn, responsible to the superintendent.

Importance of Key Points

Laboratory men need to be in the factory almost constantly to inspect, confer, teach and collect samples for bacterial analyses. The results of these analyses are excellent yardsticks to help measure the efficiency and efficacy of the sanitary control methods. Experience and study will show the key points, bacteriologically speaking, of the various manufacturing processes. So, instead of having to take samples of every batch at each step in the process, samples from the key points will suffice. The finished packed products, ready for shipment to the consumer, should be sampled frequently and the bacteriological results used as a final check on the sanitary control of the products. The standard agar plate count is an excellent yardstick for a manufacturer to use on his own products to help measure how well the rules of cleanliness have been applied. Other bacteriological technics, however, are frequently useful, depending on the nature of the information needed, and especially in examining products whose past history is unknown to the bacteriologist.

The laboratory should be an independent department. It should make its recommendations regarding sanitary control to the superintendent and work through him. Naturally, such a program requires the closest cooperation between the production department and laboratory. The latter, however, should have the final word concerning sanitary control and have the authority to reject any lot of raw material, any batch during manufacture or any finished product, or to shut down immediately any process. Such authority, obviously, should be exercised sparingly, but if the laboratory is to be held responsible for the sanitary quality of the products, it is only fair that its authority equal its responsibility.

Pure foods, cleanly produced, are in the reach of every food manufacturer. Applying the simple rules of cleanliness may tax the ingenuity of the laboratory and production personnel. Different products have different flow sheets and different production schedules. Some equipment is used daily, some 24 hours a day and some less frequently. Again, with some products, one batch crowds the heels of the preceding one, and with other products an appreciable time interval elapses between batches. But it all boils down to this: Starting out with clean raw materials that meet the proper microbiological standards; processing them in clean, sterilized equipment; guarding them against contamination by proper equipment operated by a trained and intelligent personnel, the finished products approach "commercial sterility" and not infrequently are sterile. The bacteria have been kept out.



Sterilizing large, closed, previously cleaned tanks under steam pressure. Note the plumes of escaping steam from the safety valves, also valves in the vent pipes, and the arrangement of pipes to allow cleaning. Connecting pipe lines are being sterilized simultaneously.

Further Studies on "FOREIGN MATTER" in Flour

By
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and
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DETECTION of the eggs of *tribolium* species in flour was discussed in a previous paper[1] by the authors appearing in FOOD INDUSTRIES, January, 1940. This paper outlined the "acid digestion method," briefly as follows:

(a) Reduction of the bulk of the sample by bolting through a cloth fine enough to retain the eggs[2, 3]. The eggs plus the coarser flour particles which are also retained are designated as "overs."

(b) Digestion of the overs with 5 percent sulphuric acid to disintegrate the flour clumps and wash the eggs free of adherent flour.

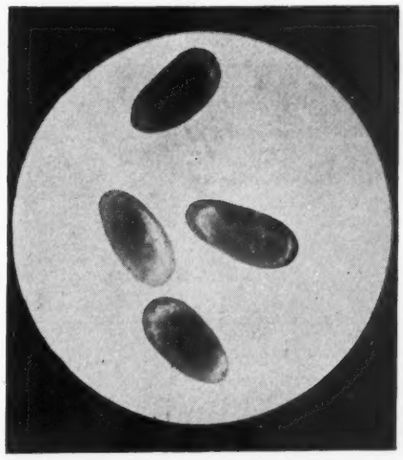
(c) Filtration of the digestion mixture through a Buchner funnel, and staining of the eggs on the filter paper with 1 percent iodine solution, the excess iodine being removed by washing with 1 percent sulphuric acid or distilled water.

(d) Inspection of the filter paper for eggs, which appear as yellow-brown or golden-brown ovate structures upon a blue filter paper.

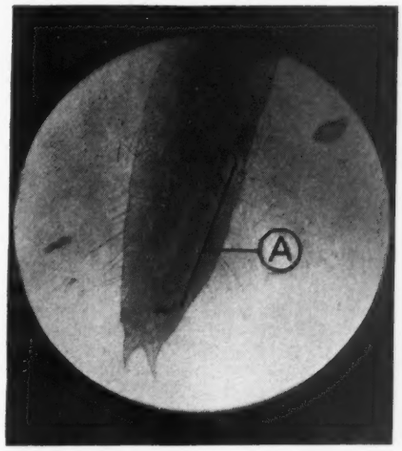
It was noted in the previous paper[1] that the method is more or less restricted to hard and soft wheat patent and clear flours. The experimental bases for that statement were not presented at the time. In this paper, therefore, the foregoing statement will be amplified, results obtained with other samples of hard and soft wheat flours treated by the acid digestion method will be presented, and comments upon certain quantitative aspects of the experiments will be given.

In the experiments, 1 kg. of flour sample was weighed in a wide-mouth, screw-top, clear glass jar. The bottom of the jar was tapped to pack the sample uniformly. Ten active adult beetles, removed from a stock culture of infested whole wheat flour, were introduced at approximately the center of the flour surface. The capped jar was then set in a darkened incubator at 27.5 ± 1 deg. C. and 50 percent relative humidity. (The average humidity was 50 percent, although the limits were 40 to 55 percent.) When desired for sampling, the container was removed from the incubator and a sample withdrawn. The jar was out of the incubator for approximately 30 minutes at each sampling.

The sampler was a glass tube of 17 mm. inside diameter, 12 in. long. Five corings, one from the center and one from each of the four corners, obtained by plunging the sampler from the upper surface of the flour to the bottom of the jar, constituted a single sample. The combined corings were placed on a previously weighed 12 cm. watchglass, then weighed and transferred to a 6XX silk bolting cloth. The cloth was arranged on a 7 in. hoop so that there were no crevices or folds in which the eggs could be retained. This set-up bolted 60 to 90 gm. of flour. Less than 0.1 gm. of sample adhered to the watchglass during the transfer.



Tribolium ***eggs in clove oil mount, magnification approximately 100×***



Posterior portion of* Tribolium *larva, mounted in clove oil and magnified approximately 100×. Note fecal material (A) within the body

Sifting was continued until no more material from the sample passed through the cloth. The overs were then transferred to a 250 c.c. beaker and the throughs were returned to the sample jar. Any adult beetles in the overs were also returned to the jar, while any larvae were subjected to the digestion and staining treatment.

The overs were wet with 1 to 3 c.c. of 95 percent ethyl alcohol. Then the beaker was rotated gently to disintegrate the clumps. Next, 30 c.c. of 5 percent sulphuric acid was added and the mixture digested for 10 minutes on a boiling water bath. The mixture was then filtered through a 9 cm. Buchner funnel containing two sheets of No. 589[a] Schleicher and Schull filter paper, or No. 613 Eaton and Dikeman (medium filtering speed) paper. The beaker was kept partially inverted over the funnel and washed thoroughly, using the spray from a wash bottle; the washings were passed through the filter. At this point the suction was diminished to decrease the speed of filtration and 30 c.c. of 1 percent aqueous iodine (1 percent iodine, 2 percent potassium iodide, distilled water) was poured over the paper. If this did not maintain contact with the residue on the filter paper for 15 to 30 seconds, another 25 to 30 c.c. was added. When the iodine had filtered through, the paper was washed with 30 to 55 c.c. of 1 percent sulphuric acid or distilled water. The paper was then removed from the funnel and examined with a 3X lens for eggs. If higher magnifications were required, the paper was observed under a wide-field binocular. The number of eggs was counted and, from the weight of sample taken, the number of eggs per kilogram of the flour was calculated.

Results are given in the accompanying table, which shows that the method is applicable to several samples of wheat flours. It is not adapted to fourth break flours because of the large content of coarse bran particles. In an attempt to separate the coarser fragments of fourth break flours, samples were first sifted through either a No. 10 or a No. 20 sieve. It was thought that the throughs from this operation could then be passed through a 6XX cloth. The difficulty of this procedure, however, was the clogging of the screen meshes by the bran particles. This prevented the eggs from passing through the coarser sieves.

Several factors precluded the possibility of ascertaining quantitatively the relation of time to infestation as determined by the egg count. While it was not the primary purpose of this investigation to make such a determination, the following items merit consideration:

1. Only ten beetles were used in each test, selected at random without regard for age or sex.

2. The number of eggs which may have hatched in the time elapsing between two samplings was not considered.

3. The method of removing corings introduced an incalculable factor. For example, on the fifth day corings were taken from sample F-1. These were weighed and bolted and all the throughs were returned to the jar, after which it was shaken gently to fill in the coring holes and resettle the flour. On the eleventh day when this sample was tested a second time, the corings were removed from the same places as on the fifth day. This meant that after the fifth day all subsequent corings consisted of a mixture of bolted and infested flour in varying proportions.

4. It has not been determined how the figure for the total number of eggs per kilogram would be affected by altering the percentage of sample tested or the location of the corings.

In view of some of these factors, it may be possible to account for the wide discrepancy in the total number of eggs per kilogram of two different samples of the same flour, such as F-1 and F-2, or F-4 and F-5. The highest number of eggs, 72 in 77.3 gm. of sample, was observed in F-16 and represents an average of almost one egg per gram after 22 days of infestation.

Note that the patent soft wheat samples, F-25 and F-26, could be handled satisfactorily on the eleventh day, although the test was not applicable on the fifth day. To determine whether the percentage boltable may have been increased by a loss of moisture, the weight of three samples was reduced 3.5 percent by drying from 2.5 to 4 hours in an oven at 50 to 52 deg. C. These experiments showed no appreciable increase in the percentage that could be bolted after drying.

In conclusion, it is evident from these results that patent clear and some first-middling hard wheat flours, and patent and clear soft wheat flours may be examined for *tribolium* eggs by the method given. In general, those flours giving no more than about one gram of overs may be tested by digestion using the size beaker and funnel, and the quantity of reagents, noted above. If larger overs (up to 5 gm.) are to be handled, they should be subdivided into portions, or larger equipment and volumes of reagents should be used. Regardless of the modification, certain flours, that is, first middlings and fourth-breaks, may give so much overs that it is impractical to employ this method.

It should be emphasized that this investigation on the detection of *tribolium* eggs in flours originated with the idea of devising some expeditious test for control and regulatory analysts to use in determining infestation in flours. With that purpose in mind, it is thought that the experiments reported here may be a contribution toward the ultimate establishment of methods for determining the *extent of infestation* in a flour sample.

The authors are grateful to International Milling Co., Minneapolis; Northwestern Elevator and Milling Co., Toledo; Standard Milling Co., Kansas City; and Edward Knighton, New York City for supplying samples utilized in the tests described in this article. Acknowledgement is also made to Irving Smith for the photograph.

Results of Flour Tests Using Acid Digestion Method

Ten beetles to one kilogram, in darkened incubator at 27.5±1 deg. C. and approximately 50 percent relative humidity.

Sample No.	Grade of Flour	Variety of Wheat	Time of Infestation in Days: 5 — Wgt. in Gm.	5 — No. Eggs in Sample (observed)	5 — No. Eggs per Kilo (calculated)	11 — Wgt. in Gm.	11 — No. Eggs in Sample (observed)	11 — No. Eggs per Kilo (calculated)	22 — Wgt. in Gm.	22 — No. Eggs in Sample (observed)	22 — No. Eggs per Kilo (calculated)
F1	Patent	Hard	79.4	2	25	71.3	14	196	72.9	21	288
F2	"	"	79.6	3	38	69.3	9	129	79.2	10	126
F3*	"	"	80.6	0	0	70.7	0	0	79.8	0	0
F4	First Midd.	"	78.8	6	76	79.8	27	338	72.6	10	138
F5	"	"	80.0	5	62	71.4	11	154	81.0	7	86
F6*	"	"	79.7	0	0	73.6	0	0	78.3	0	0
F7	First Clear	"	89.1	8	89	75.2	37	492	77.9	42	539
F8	"	"	90.6	8	88	77.4	23	297	81.4	30	368
F9*	"	"	75.2	0	0	68.9	0	0	74.0	0	0
F10	Fourth Break	"	too much overs								
F11	"	"	too much overs								
F12*	"	"	test not applicable								
F13	Patent	Soft	90.0	5	55	81.9	16	195	88.3	16	181
F14	"	"	90.9	2	22	84.1	33	392	84.1	43	511
F15*	"	"	83.7	0	0	86.4	0	0	88.1	0	0
F16	Clear	"	80.6	4	49	78.1	46	589	77.3	72	931
F17	"	"	84.5	2	24	83.4	23	276	79.9	55	688
F18*	"	"	85.7	0	0	80.6	0	0	81.2	0	0
F19	First Midd.	"	too much overs								
F20	"	"	too much overs								
F21*	"	"	test not applicable								
F22	Patent	Hard	73.4	10	136	90.1	14	155	86.8	8	92
F23	"	"	78.0	4	51	83.9	18	214	86.4	19	209
F24*	"	"	83.1	0	0	87.4	0	0	79.6	0	0
F25	Patent	Soft	too much overs			71.1	15	210	84.7	32	377
F26	"	"	too much overs			70.0	7	100	78.2	13	166
F27*	"	"	test not applicable			77.3	0	0	85.8	0	0
F28	Clear	Hard	82.6	5	60	79.9	50	626	77.9	45	577
F29	"	"	85.6	2	23	76.8	30	390	77.7	64	824
F30*	"	"	89.3	0	0	80.7	0	0	84.9	0	0
F31	First Midd.	"	too much overs; test not applicable								
F32	"	"	too much overs; test not applicable								
F33*	"	"	could not make center coring pack in sampler								

* Control. Sample of same flour, treated in same way, but uninoculated. The "number of eggs observed" was seen on the filter paper after digestion and staining; on this basis the "number of eggs per kilogram" was calculated.

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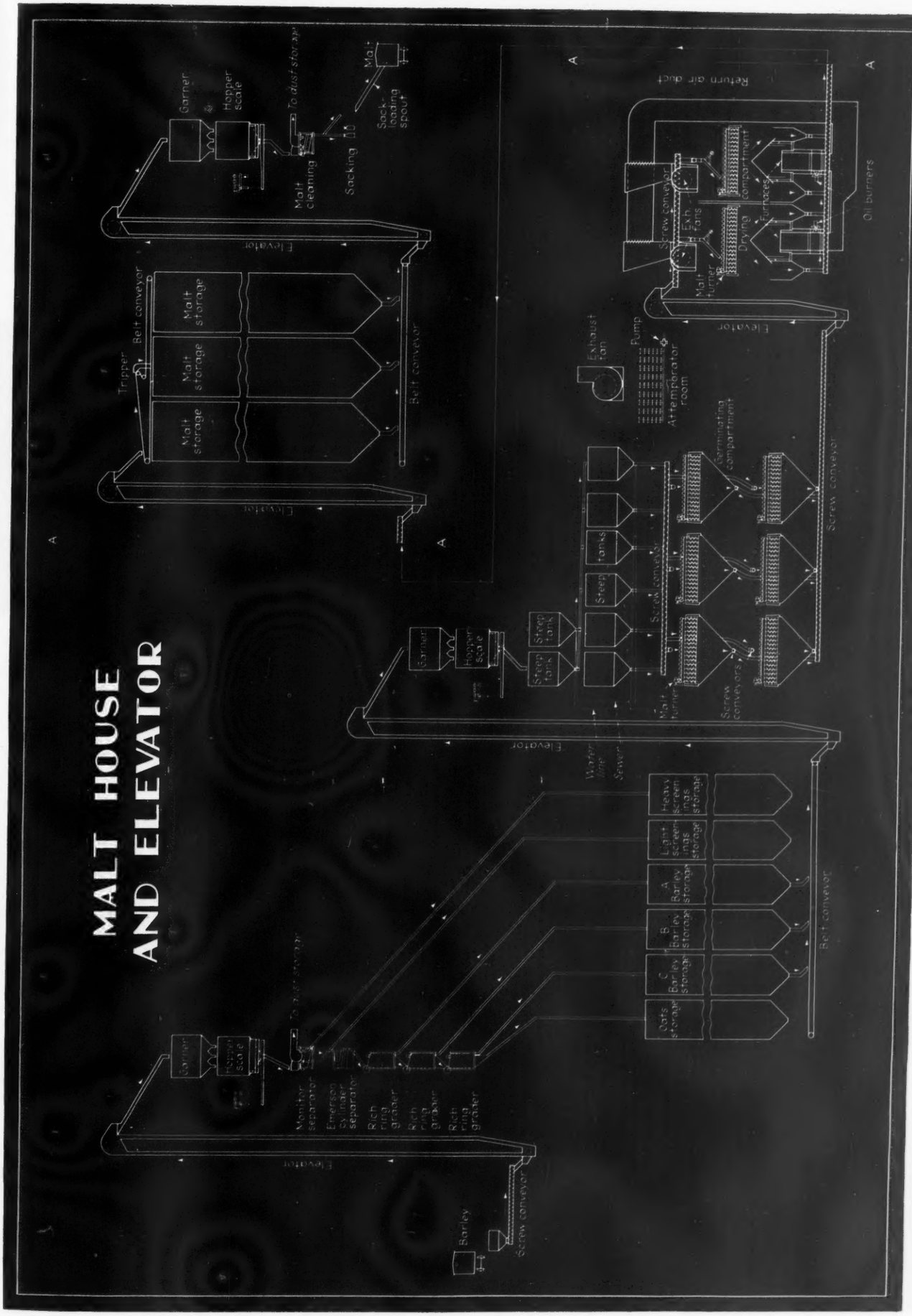
2. R. N. Chapman, 17th Report of State Entomologist, Minnesota, 73 to 94, 1918.
3. R. T. Cotton, personal communications during March and April, 1937.


MALT HOUSE
AND ELEVATOR
Barley
Screw conveyor
Elevator
Garner
Hopper scale
Monitor separator
Emerson cylinder separator
Rich ring grader
Rich ring grader
Rich ring grader
To dust storage
Water line
Sewer
Heavy screen ings storage
Light screen ings storage
A Barley storage
B Barley storage
C Barley storage
Oats storage
Belt conveyor
Steep tanks
Steep tank
Steep tank
Steep tanks
Screw conveyor
Malt turner
Screw conveyors
Germinating compartment
Screw conveyor
Exhaust fan
Pump
Air-temperator room
Return air duct
Screw conveyor
Exh. fans
Drying compartment
Furnaces
Oil burners
Malt turner
Elevator
Tripper
Belt conveyor
Malt storage
Malt storage
Malt storage
Belt conveyor
Elevator
Garner
Hopper scale
To dust storage
Malt cleaning
Sacking
Sack-loading spout
Malt
Elevator

Easy Way To Tell When To Stop Drying Process

Practical gage with which operator of vacuum dryer can quickly measure moisture content of product

By HAROLD E. RUE
Milwaukee, Wis.

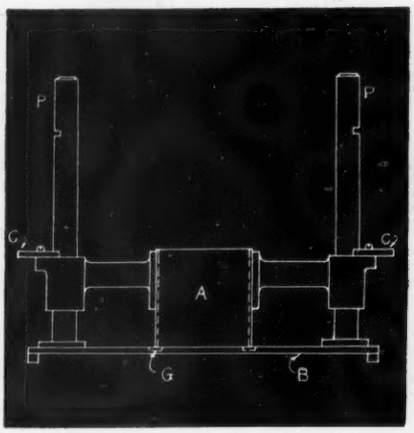


Fig. 1—Apparatus for determining angle of repose of sample taken from dryer. The angle of repose is a measure of moisture content.

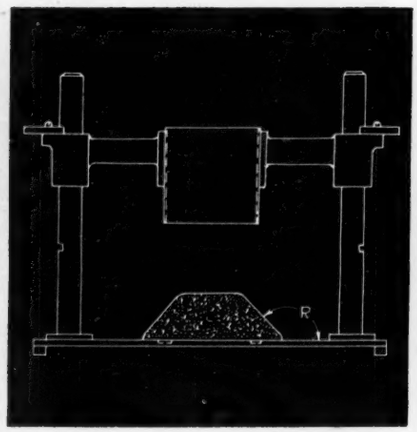


Fig. 2—After the apparatus is raised, the sample slumps and the angle of repose is measured to determine moisture content.

WHEN the mass and moisture content of material which is to undergo a process of vacuum drying are known quantities, an estimation of moisture in the material at any time during the process may be made by using any one of the several practical methods available. Such methods involve the installation of relatively simple equipment at the dryer and ordinary instructions that are within the scope of the average operator's comprehension. When such means are provided, the operator is enabled definitely to determine when the desired moisture content has been reached and the drying process is to terminate.

However, if the mass and moisture content of the material to be placed in the dryer are variables and cannot readily be determined before the material is placed therein, and if it is essential that the process be terminated when the moisture content of the material reaches a certain value, specified in advance, the operator is usually relied upon to determine the terminal point in accordance with his judgment, skill and experience. Thus the human element is introduced, with attendant dependencies and restrictions. The normal time for making laboratory determinations of moisture content in a sample cannot be allowed for during the usual production drying process, particularly when the moisture content of the batch approaches the terminal point.

The purpose of this article is to describe a method suitable for estimating the moisture content of certain material undergoing a process of vacuum drying, when subject to initial conditions as mentioned in the paragraph immediately preceding. So far as is known, the method is novel and may be found of benefit by others confronted with similar conditions.

At the canning plant of Atlantic Coast Fisheries Co. in Provincetown, Mass., large quantities of fish are processed and canned for ultimate consumption by fur bearing animals, commercialy reared for their pelts.

A part of the process involves batch drying in vacuum dryers, and the moisture content of the material entering the dryers is a distinct variable due principally to ice crystals and a mixture of frozen and nonfrozen fish.

The moisture content of the finished product in the cans was fixed within certain limits, and considerable difficulty was experienced by the operator when called upon to estimate or determine when the batch was ready to be withdrawn. Because of operating difficulties, there was a need for a method and means by which any operator could rapidly and practically estimate the moisture content of the batch at any time and determine the terminal point. Fundamentally, it was considered desirable to restrict the method to nontechnical detail and apparatus which any operator could easily comprehend.

As is usually the case when embarking on a method determination of this kind, certain preliminary observations were made. Small quantities of the material, taken at different stages in the process, were ladled out on a flat surface and investigated by direct observation. During these preliminary observations, changes in the consistency of the material and the degree of "slump" when placed on a flat surface seemed to indicate a relationship between the moisture content and the angle of repose. Further experimental work of a more refined nature confirmed the indication, and a definite relationship between the moisture content of a sample and the corresponding angle of repose was found to exist. Thus the basis for the method was established and the completion of it involved only experimental work and observation to accumulate essential data.

When obtaining data, two equal samples were taken from the dryer, simultaneously and at various intervals during the drying process. One was sent to the laboratory for accur-

ate determination of moisture and one was immediately used to determine the corresponding angle of repose. During the processing of one batch, the process was intentionally carried beyond the normal terminal point in order to obtain data.

Since accurate records were kept, it was only necessary to "key" the moisture content, as reported by the laboratory, to the corresponding angle of repose, as measured, to have all the data necessary for employment of the method.

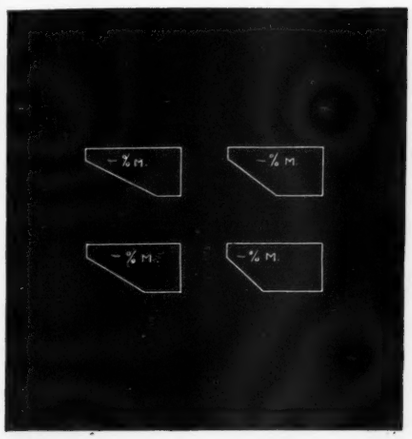


Fig. 3—Sheet metal gages for measuring angle of repose to determine moisture content of sample. Gages are marked in terms of moisture content.

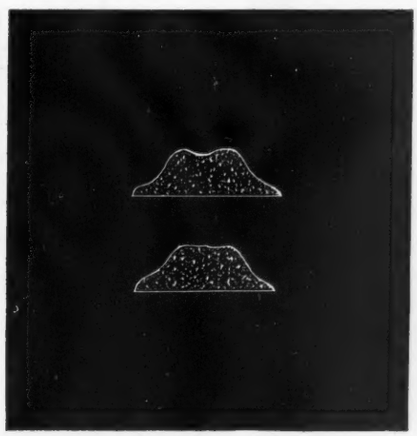


Fig. 4—When samples assume contours similar to these the angle is measured in terms of the longest element of the irregular cone frustum.

An apparatus such as is shown conventionally in Fig. 1 was used for determining the angle of repose of the sample taken. The entire device was of light weight and easily handled.

THE container *A* was a plain, thin cylinder with both ends open and of approximately the same volume as the cans to be filled on the production line. The bottom edge of cylinder *A* was held down against the gasket *G* in flat, smooth plate *B* by means of latches *C* on the two posts *P*. Container *A* was filled to the level of the top with a sample of material. The entire device was placed on a flat, level support and *A* was quickly raised to a position as shown in Fig. 2. The sample slumped and the angle of repose *R* was then determined in a conventional manner and recorded. Later on, sheet-metal gages, as shown in Fig. 3, were accordingly made and marked in terms of moisture content in the corresponding sample, as reported by the laboratory.

While measuring the angle of repose of samples it was observed that, due to irregular-size particles, dryness or arrangement of particles in the sample, some of the samples, when slumped on the plate, assumed a contour similar to those shown in Fig. 4. In such cases the angle was measured in terms of the longest element of the irregular cone frustum without an appreciable error resulting.

After the apparatus shown in Fig. 1 had served its purpose experimentally, it was issued to the operators, with a complete set of gages, marked in terms of percent moisture, for practical use.

In actual practice, the operator takes a sample, fits a gage to the slope the material has assumed on the flat, level plate and is immediately informed of the moisture content by the markings on the gage. Samples are taken considerably in advance of the desired terminal point, and frequent sampling is carried on as the material approaches this point. Since determinations may be made as rapidly as samples can be taken, it is not difficult to ascertain when the desired moisture content has been reached and the batch is ready to be drawn off.

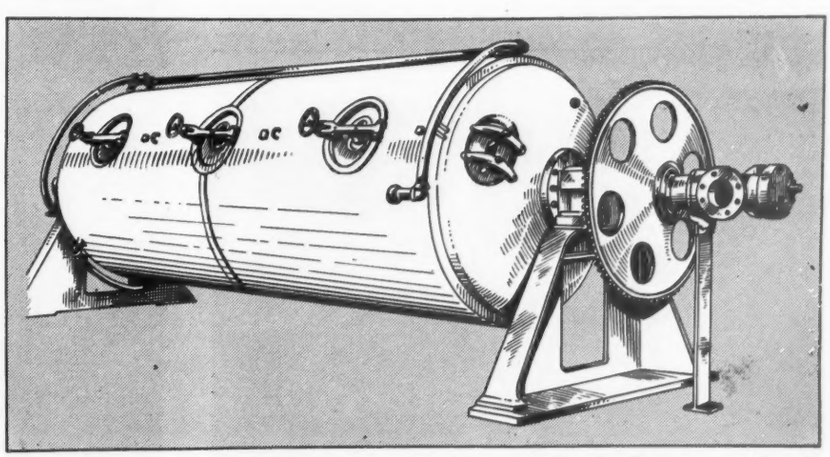
The operator using the method is not required to interpret reference tables or use complicated apparatus, and the estimate is obtained by direct observation. The ease with which an estimate may be obtained will appeal to the average operator, who ordinarily would shun the use of chemical glassware, delicate apparatus or means that involved an approach to technical procedure.

Since the angle of repose corresponding to a certain moisture content varies with the material under consideration, there is no general case and each special case must be investigated and worked out separately.

It is to be noted that the method may not apply in certain cases where, for instance, the size of the particles in the batch may be so large as to affect the slump and hence the angle of repose, or where the terminal-point moisture content is unusually high or low.

Where adaptable, the method does present excellent possibilities for the estimation of moisture content and was found effective and useful for the case described. It will eliminate the hazards and risks incidental to individual judgment, and the normal expectancy is that the operator will be attracted to it as a relief from personal responsibility.

The adaptability of the method to specific or special cases may be easily and readily determined by carrying out experimental procedure which is relatively simple and inexpensive.



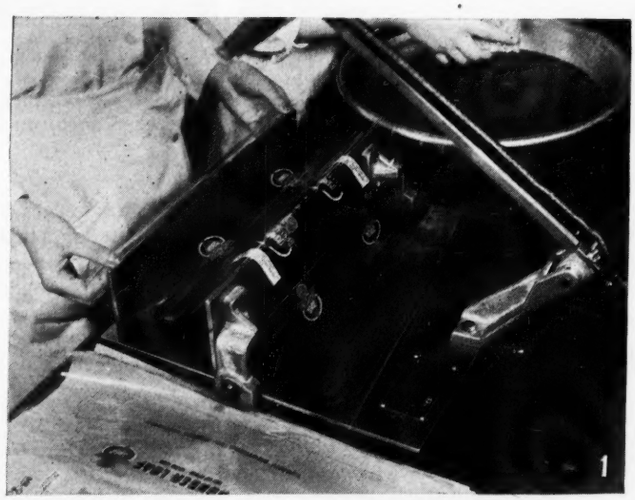
Rotary vacuum dryer of type used in dehydrating foods. In drying a product it is important that the process be stopped just when the moisture content of the material reaches the desired point. Attainment of that control presents a problem because there is not time for a laboratory analysis. But the problem can be solved by use of the method and device described by the author.

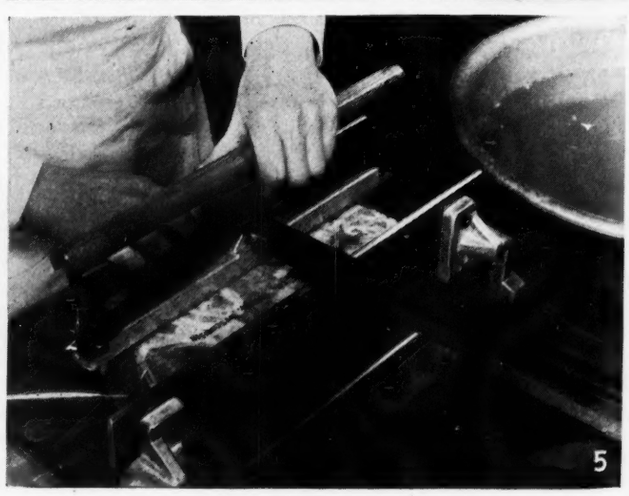
Close-up of a "Wonder Loaf" packed by Cudahy Bros. Co. in the "Pliofilm Mil-O-Seal" wrapper. More than 30 packing companies are using this packaging material for meat loaves.

NEW WRAPPER Solves Problem For Packers

Thirty companies put meat loaf into "Pliofilm" because it greatly reduces shrinkage and offers other advantages

This article on
PACKAGING
Is of interest to
All Food Manufacturers
Because it reveals important results obtained with a new package for a food product. These results have a bearing on many food industry problems.—The Editors.





PROFITS evaporate, literally, in the meat packing business. Meat products lose moisture, and hence weight, between the plant and the consumer. And every ounce lost is an ounce the packer produced but did not sell.

Which explains why some 30 packing houses have adopted a new wrapper—rubber hydrochloride—for meat loaf. A meat loaf which weighs 6 lb. at the plant often loses as much as 9 or 10 oz. by the time the butcher slices it for consumers. The average shrinkage is said to be from 8 to 10 per cent. Nearly all of this loss has been eliminated by the new wrapper, extensive tests have indicated.

Consider, for instance, tests conducted at the plant of Cudahy Bros. Co., Cudahy, Wis. Two freshly made loaves were used. One, weighing 5 lb. 8½ oz., was packed in the new wrapper. The other, weighing 5 lb. 9 oz., was inserted in another type of wrapper for meat loaf. These test loaves were then placed side by side in the cooler and in no way disturbed for seven days. At the end of this period, the older type wrapping was slimy, the loaf had turned a dark red in color, the package had lost its shape through contraction of the wrap, and the scales revealed that the meat had lost 9 oz.

The loaf wrapped in the new material was dry, it had the same color as a freshly packed loaf, it retained its original squareness in cross-section, and its weight loss was only ¼ oz. This test was conducted in a cooler where the temperature was held at 40 deg. F. during the experiment.

In a second test, two meat loaves were kept side by side for 90 hours in a room where the temperature was between 75 and 80 deg. The loaf wrapped in the new material lost ½ oz., the other 8½ oz. Both loaves were then left undisturbed for seven more days. At the end of that time, the meat loaf in the old wrapper was spoiled and badly molded. The one in the new wrapper retained its fresh appearance and was subjected to a further test—sampling. Cudahy employees tasted the meat and found it "tasty, appetizing and in fresh condition."

OVER a period of several months extensive tests, of which the foregoing are examples, are reported to have revealed other advantages than saving in loss through shrinkage.

1—First step in the application of rubber hydrochloride wrap to meat loaf.

2—Second step. The wrapper is in place and second operator is dipping meat loaf into gelatine prior to placing it in wrapping machine. It is possible for one girl to do both operations.

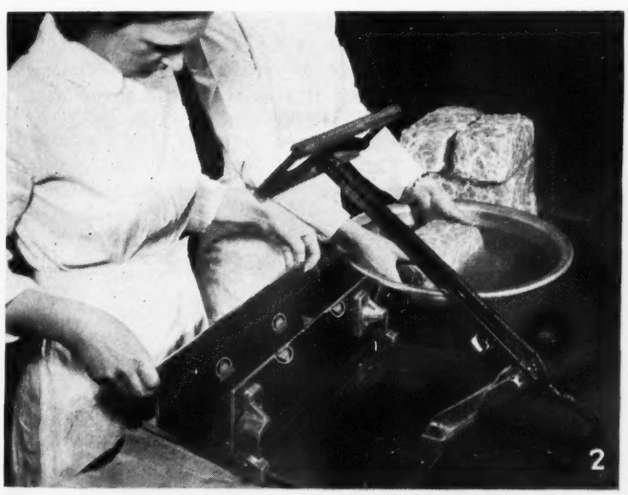
3—As one operator holds the sheet of wrapping material in place, the second operator places the gelatine-dipped loaf between the jaws of the packaging machine.

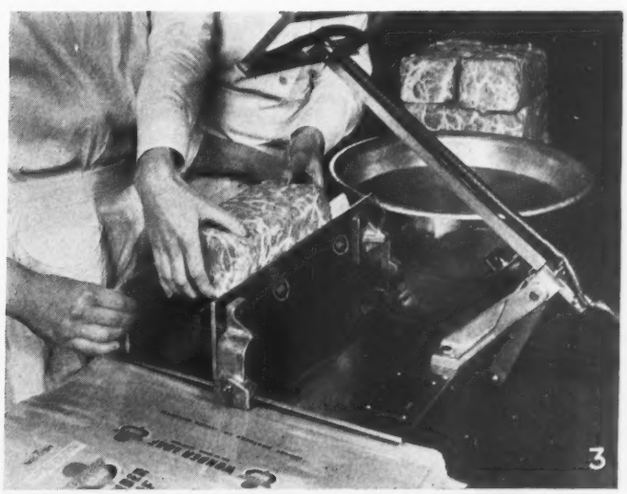
4—Operator laps the edges of the wrapper and squares up the package.

5—Sealing the wrapper with the electrically heated sealer bar.

6—Removing the loaf from the wrapping machine.

7—Completing the packaging operation by twisting the ends of the wrapper and tying it with cotton cord. After one end is tied, the second end may be twisted up easily to take up all slack, eliminating wrinkles and making a smooth package.





These advantages have been summarized as follows:

1. The new wrapper costs less than heavy-weight cellulose and compares favorably in cost with the new light-weight cases of this type. (The new wrap costs 30 to 40 per cent less than the heavy-weight cases.)

2. Indications are that the new wrapper will reduce labor cost through the ease with which it may be handled and applied.

3. Former troublesome breakage of containers in production is virtually eliminated, as only abnormal or deliberate mishandling will cause damage.

4. The new wrapping material increases keeping quality beyond the ability of all other materials tested. No mold or slime developed with meat loaves kept in the new wrapper eight weeks at 44 deg. or three weeks at 72 deg., indicating feasibility of the product's use in export shipping.

5. Cooked products do not darken and baked loaves do not bleach in the new wrapper, giving increased consumer appeal.

6. The package is attractive, as process color printing, including pastels and metallics, may be utilized to reproduce trademarks, company insignias, and so forth, on any part of the wrapper.

7. The rubber hydrochloride does not shrink, and as a result the meat loaves wrapped in it are not distorted from their original shape.

8. In shipping tests the new wrappings stood up better than other materials.

9. The rubber hydrochloride wrapper may be sliced easily by the butcher without dulling the knife. Or it may be opened at one end and slipped back for slicing and later retied for returning the product to the refrigerator. This eliminates dried, crusted ends.

10. Odd-shaped loaves or glazed or fruit-decorated hams can be packaged without additional effort.

The new wrapping material, called "Mil-O-Seal," is made from Goodyear Tire & Rubber Co.'s "Pliofilm," converted by Milprint, Inc., Milwaukee. Milprint developed a machine for applying it which is of simple construction. It consists essentially of a base, an adjustable plate, a heat-seal bar and a thermostat. All parts, except the thermostat and the handle for the heat-seal bar, are of stainless metal.

The base may be bolted to a worktable, or the machine may be used without permanent mounting. The vertical side, or jaw, of the machine nearest the operator acts as a guide for forming one side of the package. It is fixed, and its face is covered with a thin layer of rubber which serves to anchor the Pliofilm so that it will not slip when the wrap is being pulled up tightly around the meat loaf. The adjustable plate, farthest from the operator, slides along the base plate and is equipped with wing nuts for tightening.

In forming the package, the operator places the wrapper across the vertical guides, while a second operator immerses a loaf in gelatine. The loaf is then placed upon the wrapper and let down gently to the base plate, which forms the bottom of the package mold. The wrapper is then lapped on top of the loaf and sealed by depressing and rocking the heat-seal bar. The loaf is then lifted from the machine and placed on the table where the ends of the wrapper are twisted and tied with cotton cord. The various steps involved in forming the package are illustrated in the accompanying pictures.

While one operator may readily handle the entire cycle of packaging operations, two usually are used so that the one who does the gelatine dipping need not handle the finished package.

This method of packaging eliminates the stuffing operation; no soaking is required; the packaging may be done on a dry table, and the finished package is dry and clean. Then, the package is built around its contents so that it will conform to variations in shape and contour of the product.

Meat loaf packaging line in the plant of Cudahy Bros. Co., Cudahy, Wis.

Success in Byproduct Production Demands QUALITY CONTROL

Need for sanitation and close control of process variables even in producing non-edible byproducts is illustrated in the manufacture of casein

By JOSEPH CHRISMAN
Chemical Engineer, American Butter Co., Kansas City, Mo.

IN the production of any article of commerce of first quality, where the manufacture rests to a great extent in the hands of a few skilled operators, one of the fundamental requirements is that the chemist or engineer responsible for production shall have a real respect for and trust in those men who are practicing their art. He must so conduct himself that those who are performing the operations will likewise respect him personally and trust in his judgment. Establishment of such a feeling of mutual respect and trust will make the road to improved quality much smoother and shorter, and marked with fewer monuments of scrapped product.

Another rather generalized rule, if high quality is the aim, is the maintenance of a neat and clean establishment. Neatness and cleanliness of surroundings will go a long ways toward engendering in the operator a feeling of gride in his plant, in his product and in the proper performance of the rather exacting duties of his art without which uniformly high quality is difficult of achievement. A dirty, slipshod plant is not conducive to conscientious exactness of operation.

In the particular field to be discussed here, the manufacture of hydrochloric acid precipitated casein, the foregoing generalizations are applicable. Inasmuch as close technical control must be maintained, cooperation between the laboratory technicians and the producing operators is essential; and to bring a good price in a highly competitive market, casein must be clean and conform rather rigidly to the several qualifications demanded by the discriminating customer.

The main features to be controlled for quality of finished casein are final "free" acidity, "total" acidity, ash, moisture, solubility, color and freedom from extraneous materials. Odor must be watched and screen analysis, too, providing the casein is being sold as a sized product. These can all be easily and quickly determined in the laboratory and are all amenable to rather close control in the process of manufacture, within reasonable limitations.

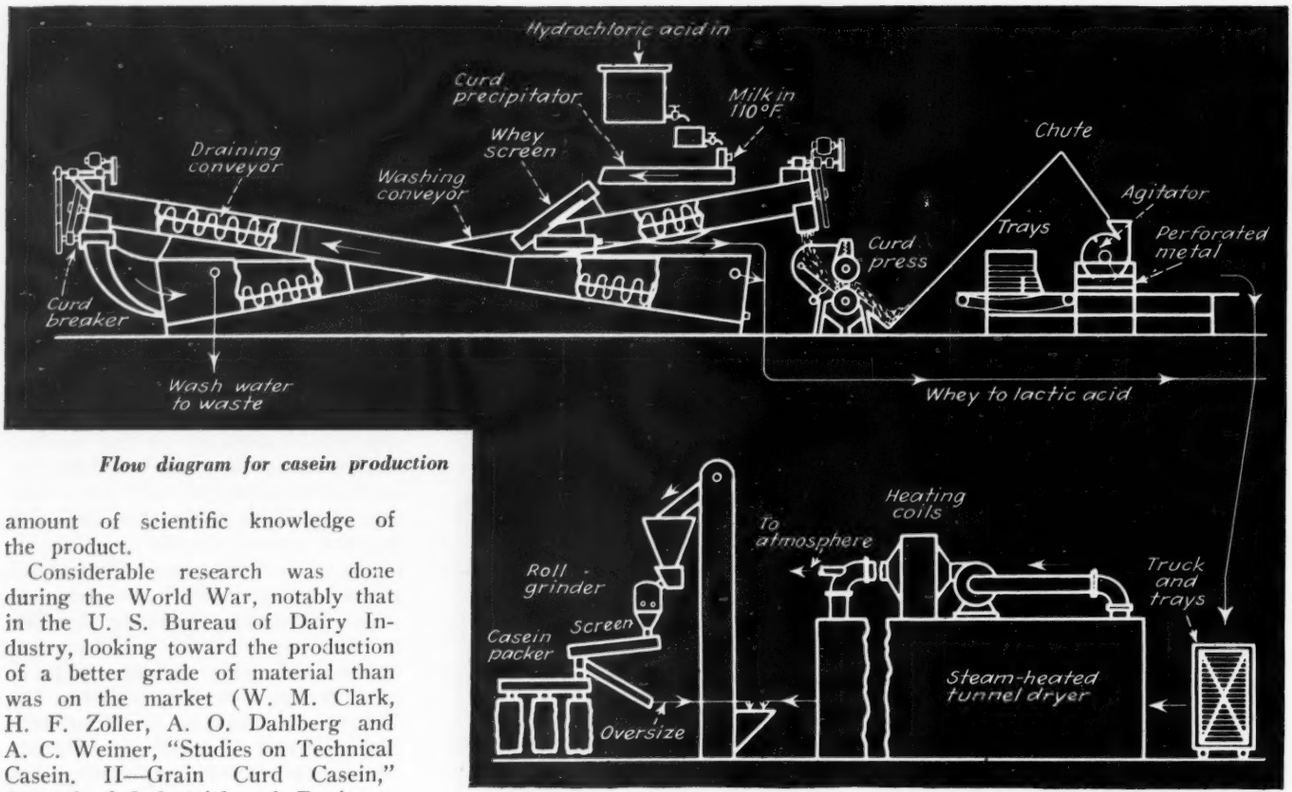
Viscosity, strength of adhesiveness and foaming tendency are three physical characteristics which might also be included in routine testing, but these qualities must be varied distinctly to suit the manner in which the casein is eventually to be used. If a standard casein were being manufactured for a customer who specified the viscosity or adhesive strength under definite conditions of solution, then the problem could perhaps be worked out to his satisfaction. But, put into use by another customer who employs different methods and reagents in dissolving it, the same casein might prove very unsatisfactory.

An effort to set up a definite correlation between all of the various characteristics of casein would involve an interesting study. And much work has been done along that line. But for the casein manufacturer to attempt to meet the exact specifications of each user would involve numerous tests with many different possible combinations of eight or a dozen reagents and with varying temperatures and modes of procedure. The best he can hope to do in an economic way is to make a good grade of material, low in free acidity, low in ash content, easily and completely soluble in conformity with the fairly well standardized borax solubility test, with a good light color and free from yellowed particles or foreign material. If he does this, and continues to study the relationship between the various chemical analyses and the physical properties with a view to being able to meet the more exacting demands of the future, he should fare pretty well in the marketing of his product.

Fifteen or twenty years ago the manufacture of casein was, for the most part, conducted as an art along rule of thumb methods, by operators who had generally grown up in the milk industry and whose knowledge consisted chiefly in the fact that when milk soured it was transformed into curds and whey. They knew that this souring could be accomplished more rapidly by means of acids other than that produced normally in the milk itself, and many manufacturers were using either commercial hydrochloric or sulphuric acid for the purpose. Those who were using the whey for the production of sugar of milk necessarily used hydrochloric, as natural souring meant the destruction of the lactose. And sulphuric acid introduced interfering elements in the sugar refining. Very few manufacturers employed trained chemists or chemical engineers to exert control over the process in the past. Nevertheless, some very good casein was made in spite of the lack of any great

This article on
QUALITY CONTROL
Has suggestions for
All Food Manufacturers

It stresses the importance of close laboratory and production control, particularly by means of recording instruments and controllers. It emphasizes the danger of overlooking some apparently small detail that may profoundly affect quality of product. And it shows the need for understanding and cooperation among management, laboratory and the workers who actually do the work.—The Editors.



Flow diagram for casein production

amount of scientific knowledge of the product.

Considerable research was done during the World War, notably that in the U. S. Bureau of Dairy Industry, looking toward the production of a better grade of material than was on the market (W. M. Clark, H. F. Zoller, A. O. Dahlberg and A. C. Weimer, "Studies on Technical Casein. II—Grain Curd Casein," *Journal of Industrial and Engineering Chemistry,* **12,** 1163, 1930). A few of the more progressive paper companies began to press their demands for a better product, and some of the larger and more forward looking manufacturers came to a realization that continued sale of this important byproduct of milk was dependent upon improvement of quality and, more particularly, upon a sustained uniformity of the chemical and physical characteristics of the material from day to day and month to month. Such a study of improvement and controlled quality called for laboratories and technical supervision in manufacturing. The producers of the better grades of casein now maintain such supervision and control.

The first point of control is in the quality of the milk itself. Unlike the raw material from which many an article of commerce is made, skim milk is subject to control of some of its qualifications. Precautions must be taken to the end that it shall be practically free of butterfat. This is not a very disturbing problem where all of the supply originates in one skimming station, because the handling of a large volume of whole milk is usually accompanied by close supervision of butterfat recovery. The central skimming station can be checked up at regular intervals and will welcome this additional assurance as supplementing its own butterfat tests. For the casein plant which receives its supply from numerous sources, it may be advantageous or even necessary to provide additional separating equipment at the byproduct plant to care for the milk from those patrons who are not properly equipped or who, for one reason or another, do not deliver a satisfactorily separated product. Too high a fat content is detrimental to the adhesive properties of the finished casein—a prime requisite in most fields of its use.

Proper Sanitation Important

Final acidity, both "total" and "free," is a very important characteristic in the opinion of the consumer. It bears a direct relationship to the quantities of solvent materials he must use in preparing the casein for application. This acidity, checked in the laboratory, must be watched in the process at several points. The first consideration should be given to the milk itself. Prompt delivery from the producer to the separators and likewise from the separators to the casein plant is important, particularly during very hot weather. The sanitary condition of all containers and apparatus with which the milk comes in contact must be watched. Here again, the central skimming station is probably as much or more interested in maintaining good sanitary conditions as is the skim milk user; at least up to the point where the milk leaves the separators. With a multiplicity of sources of supply, some will be found which must be continually watched and corrected. Whether delivery is made in tanks or through pipelines to the storage tanks in the byproducts plant, the cleanliness of the conveying equipment must be assured at all times. This is particularly important if the whey is to be used in the production of sugar.

If the milk is delivered at relatively high temperatures, for instance if it comes directly from the separators, it should be worked with a minimum of delay. If it is cooled before delivery a storage period in the casein plant will do little harm, providing storage tanks are kept clean. Prompt handling is, however, always to be desired. Precipitating temperatures are such as to be conducive to the formation of lactic acid, and promptness in handling the curd and whey is essential if lactic acidity is not to be advanced to a detrimental degree.

Washing of the curd is probably the most important step in the procedure of making a high quality casein. The amount of washing required depends on the nature of the curds themselves which, in turn, is largely dependent on the temperature of precipitation, the pH at which precipitation was accomplished, and the degree of agitation employed. The amount of washing, too, depends on the completeness with which the whey has been removed from the curd prior to washing. All of these features must

be kept in mind and rather rigidly controlled if the final acidity of the casein is to be kept within the prescribed limits. Prompt drying of the curd after it has been washed and pressed is important. There is still a good chance of acidity building up in the moist curd if it is held too long before being dried.

Temperature Control Paramount

Assuming that a skim milk of good and uniform quality is being delivered, the matter of quality control lies in the care with which the operations of manufacture are carried out. The temperature of the milk at the point of precipitation of the casein is one of the most important details. Whether the process is a continuous one or a matter of batches, the importance of having all material precipitated at the same temperature is paramount. Slight variations in precipitating temperature, all other factors remaining constant, can play havoc with uniformity of quality and can easily lead to much trouble in the mechanical handling later on. The texture of the curd, the size of the curd particles, their amenability to good washing and proper drying can all be affected by temperature of precipitation. The solubility, ash and acid content and color may all be affected. Carefully controlled temperature promotes uniformity.

Ordinary mercury thermometers may be provided for the operators' use in checking milk temperatures but they are not the most satisfactory means. A continuous heater-cooler unit of a type which can be automatically controlled by a recording-controlling thermometer installation lends itself well to any continuous process and will afford a complete record of precipitating temperatures for later reference. The same device can be used to good advantage in batch operations when supplemented by auxiliary heating and an additional recording thermometer in the precipitating vat. For purposes of control, a recording thermometer, with its continuous record of temperatures, is very desirable.

After the milk has been heated to the exact temperature desired, the next step is the actual precipitation of the curd by the addition of acid. Preparation of the acid itself is a preliminary to this step which must not be overlooked. Varying degrees of dilution are used in the industry. Once the degree of dilution is decided upon, it should be frequently checked in the plant operation to see that it is not allowed to drift in either direction in any appreciable amount. The best of operators will occasionally get in a hurry and neglect a small item such as this. Uniformity of product is the result of uniformity of procedure in all details.

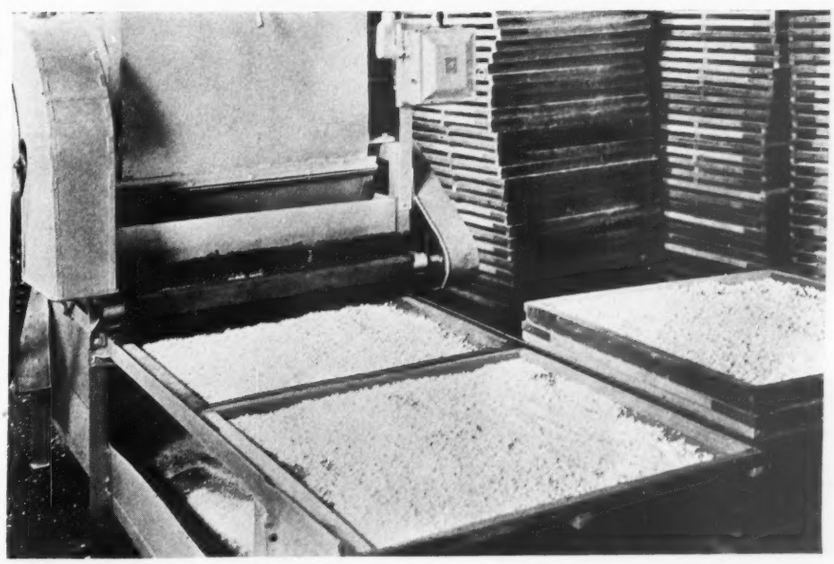
The acid, properly diluted, is added to the milk either continuously or in batches. In either case the end point of the reaction is an extremely important factor in the production. It must be controlled within close limits for the best results. Automatic control of the flow of the acid would probably be the ideal set-up in any continuous process. This could be accomplished through the installation of an electrometric pH recorder-controller, by means of which a valve opening could be increased or decreased as slight variations in pH demanded. A main valve supplying the minimum acid requirement could be set wide open and the pH controlled valve act as an auxiliary bypass to care for fluctuations. Such an installation would be fairly expensive and, unless large volumes of milk were being handled at all seasons of the year, the expense probably could not be justified. The same device, modified to only indicate and record, would be less expensive and should be very satisfactory under the eye of an experienced and careful operator. The latter device would be applicable to batch operation as well as continuous process.

The ordinary plant, lacking the refinement of such pH apparatus, can control the reaction adequately through manually operated valves and frequent checks of the pH by means of colorimetric indicators, such as bromcresol-green. There are indicator papers on the market which cover the range desired and may be used to good advantage by skilled operators. Periodic checks should be made by the laboratory control chemist to see that operators keep within the prescribed limits. Operators may sometimes develop a temporary color blindness or will be misled by varying intensity of color encountered in commercial indicator papers.

Temperature of precipitation and pH of precipitation are somewhat interdependent, and the same remarks made previously concerning the effects of temperature variation apply to an equal, if not greater extent, to pH variation. Neither is absolutely inflexible in the production of good casein, but when one is varied it will usually be found advisable, if not absolutely necessary, to vary the other. The thing to remember is, temperature and pH of precipitation having once been established, they should be maintained at the established points without variation to assure unvarying uniformity of finished product.

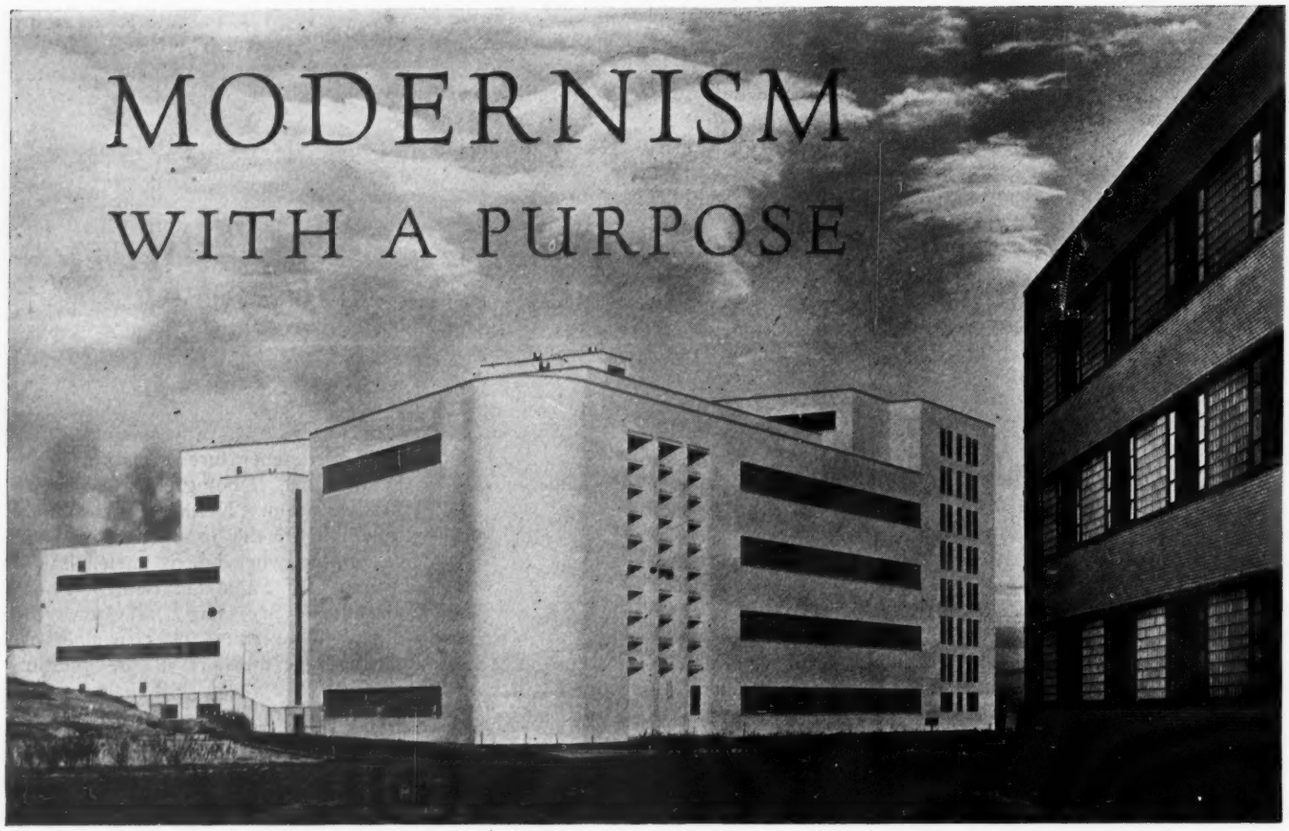
The precipitation having been accomplished, the finished product is pretty well established as to its fundamental characteristics. Nevertheless, it can be ruined in the succeeding steps of washing, dewatering and drying. But, providing these later steps are carried out in a proper manner, the chemical and physical features of the material as dried have already

(Turn to page 96)



Casein, first precipitated as curd by the action of hydrochloric acid on skim milk, then separated from the whey and thoroughly washed, then pressed to remove some of the moisture and forced through a screen to break up large particles, is uniformly spread on the drying trays by this automatic device.

MODERNISM WITH A PURPOSE



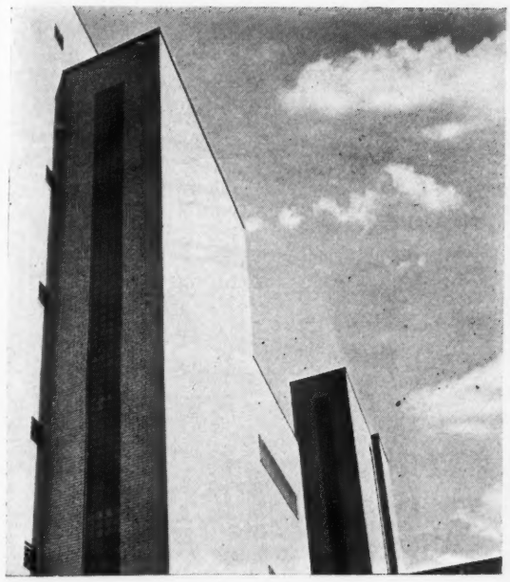
Church & Dwight, Inc., wanted a new baking soda plant which would reflect the cleanliness inside the plant. This was accomplished by modern design and by the use of smooth-faced buff brick, glass block and by covering the exposed edges of the lintels with stainless steel. The rounded corner of the building accommodates storage bins from which refined bicarbonate of soda drops to a conveyor and passes through a tunnel under street to modernized packing plant.

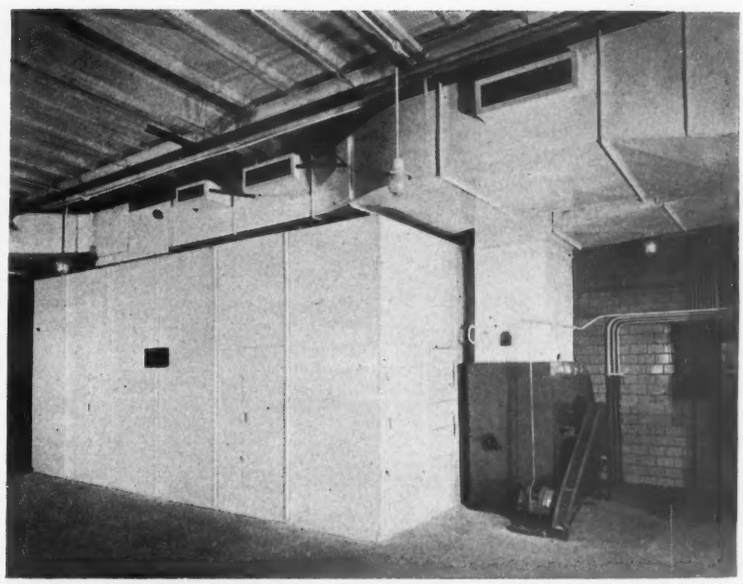
Accessibility is the keynote of the new modern Church & Dwight baking soda plant. Tanks and vats, supported on the electrically welded framework, can be conveniently reached from stairs and balconies.

New plant typifies practical application of functional design

ONE of the most modern plants in the food industries has been built at Syracuse, N.Y., by Church & Dwight Co., Inc., manufacturers of "Cow" and "Arm & Hammer" baking soda. And an outstanding job of face-lifting has been done on an old baking soda packing plant by the same company. These plants are illustrated in accompanying pictures supplied by The Austin Co., the engineers and builders. One view of the new baking soda plant is shown on the cover.

This new plant illustrates the practical application of modern functional design in which the frills are eliminated and fewer kinds of materials are used.



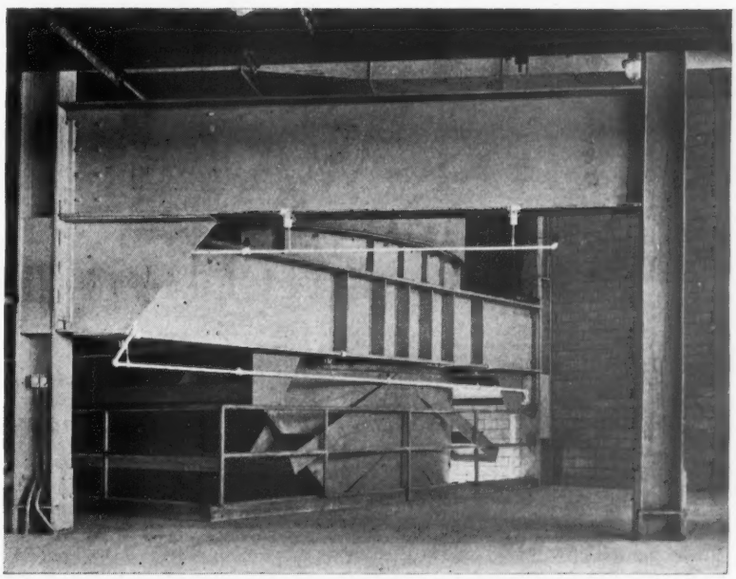


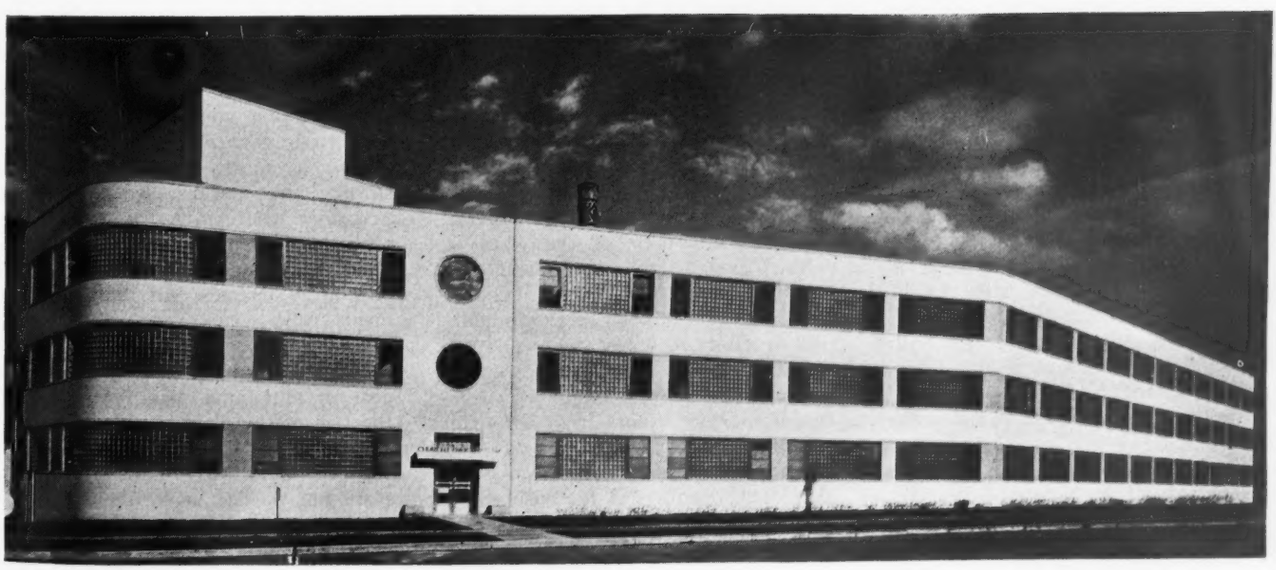
(Above, left.) Glass block has a functional as well as an ornamental use in the new Church & Dwight plant. Panels in the wall admit light to the factory and vertical panels in the tall shafts illuminate the stairways. Glass block excludes dirt, dust and fumes.

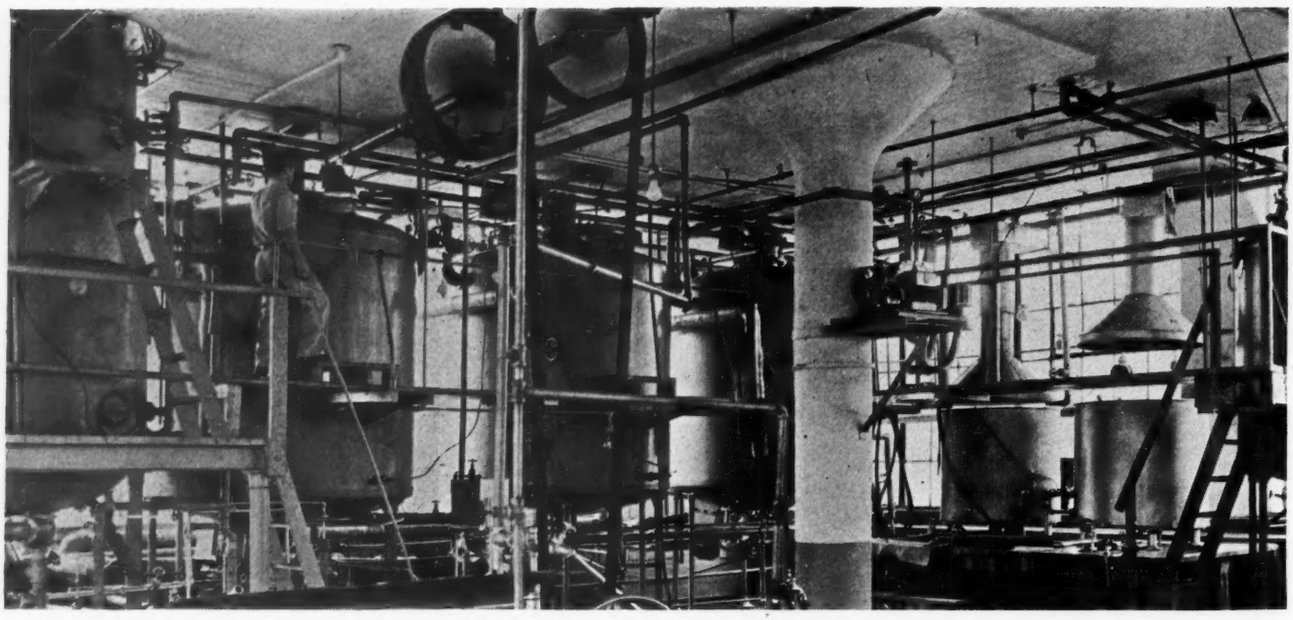
(Above, right.) Air conditioning units ventilate the new windowless baking soda plant of Church & Dwight. The purpose is to improve the purity and quality of the product. Freon compressors in the basement supply the refrigeration.

(Right.) Fifteen hundred tons of electrically welded steel was used in the new baking soda plant. This type of construction gives a rigid structure and reduces maintenance costs. This view shows how building is braced and storage bins are supported.

(Below.) An excellent example of industrial redevelopment—the Church & Dwight packing plant after its exterior had been modernized to make it harmonize with the new baking soda plant shown on the opposite page. A three-story addition, at the left of the entrance, was built to house the offices. Because this building was not air conditioned, ventilating sections of steel sash were used.







Scene on the third floor of the plant of Cary Maple Sugar Co., Inc., St. Johnsbury, Vt., where frequent washing with hot water and repainting preserve the equipment and building in spite of adverse conditions caused by the manufacturing operations.

HOT WATER and PAINT Give Effective Maintenance

Sirup boiling and handling call for definite program of washing and painting

CONDENSATION of vapor upon the building interior and equipment and the hot, sticky nature of the product handled have resulted in washing and painting being the principal items of maintenance at the plant of Cary Maple Sugar Co., Inc., St. Johnsbury, Vt. Equipment included in the maintenance operations covers the sirup boilers, the sugar making apparatus, piping, bottle machinery and accessories.

Cleanliness is an absolute necessity in this maintenance program, and liberal use of hot water is the best means to this end. But washing is not effective unless the paint on all surfaces is kept in good condition.

Frequency of painting varies with the conditions obtaining in the different departments and is closely related to the frequency of hot water washing.

The bottling department is completely painted each year, during the slack period in winter. The packaging machinery is painted with aluminum paint, which has a pleasing appearance, is easy to clean and stands up well when washed with hot water two to three times daily. Walls and ceilings in this department are given a yearly coat of flat white lithopone paint, with a dado on walls and pillars of gray enamel. Insulated piping receives a yearly coat of gray enamel.

Sirup vacuum tanks for standardizing and other equipment on the third floor (sirup is kept at 200 deg. F. for easy flow) are painted with heat-resisting gray enamel. Everything on this floor of the plant is washed every night. Cleaning compounds are not used, as the sirup is readily soluble in hot water. In addition to ability to withstand wear from washing, this paint must withstand action of the large amount of condensation from vapors from hot sirup handling. On a cold winter day this condensation on the walls is so great that small openings at the base of the window frames had to be provided to take care of the drainage.

Similar conditions obtain in the sugar department on the second floor where sirup is concentrated by boiling. Here the walls and ceiling receive a yearly coat of gray enamel. It is not necessary to wash here as often as on the third floor, as the equipment only operates full time for about four months of the year. Under full operating conditions washing is done twice each week.

On the fourth floor where sirup storage tanks are installed and on the first floor where raw sirup drums are received from producers and emptied, tanks, walls and ceiling are painted with gray enamel. In these departments, one coat every other year, with touching up in between, serves.

All steam piping receives a fresh coat of aluminum paint yearly. All the rest of the plant is painted in the standard gray enamel, for easy cleaning and uniformity. All parts of the plant not washed more frequently are washed each Friday at the close of each week's production.

The Facts About "Artificially" Ripened Fruit

Part II

By NORWOOD C. THORNTON
Boyce Thompson Institute for Plant Research, Inc., Yonkers, N. Y.

ALTHOUGH ethylene was originally used only in connection with hastening the coloration (i.e., pigment changes concerned in the process of ripening) of mature or nearly mature fruit that was slow to develop the color desired by the consumer, there soon was initiated the idea that the treatment would completely ripen quite immature fruit and vegetables. It was suggested that even such immature fruits of tomato or melon as are caught in the green condition by early frosts could be satisfactorily ripened with ethylene, and further that windfall immature apples could be sweetened by treament before being used for cider.

However, it has been proved by many investigations that immature fruit cannot be chemically ripened with ethylene; that only mature yet green colored fruit can be properly colored by use of ethylene. Immature tomatoes either don't color or they color poorly. Immature persimmons will not develop the proper color and flavor, and immature avocados take on an unnatural and undesirable brassy color when treated with ethylene. Immature citrus fruit does not color in a desirable manner nor will melons reach a desirable condition for market if harvested immaturely and treated with ethylene. Thus, no grower or handler of produce is knowingly going to jeopardize his business by attempting to treat immature fruit and pass it on to his customers.

Scientists in all parts of the world have been unanimous in their conclusions regarding the effect of ethylene upon fruits and vegetables. In 1927, Chace and Church reported that ethylene treatment produced no sweeter oranges than obtained by any other method of coloration of the fruit, which was also confirmed by Ramsey and Musso, 1930, and Bates, 1932. Chace and Church also found that ethylene-treated dates were no better chemically than untreated dates. They did find, however, that the treatment caused a rapid loss of astringency of the persimmon, as well as a rapid coloration and softening of the fruit, but even this would have occurred under normal ripening conditions—at a much slower rate. Davis and Church, 1931, found no difference in the sugar content of persimmons ripened either with or without ethylene.

Chace and Sorber, 1928, found that Bartlett pears treated with ethylene arrived at the canning stage much quicker, yet were of the same sweetness as those ripened normally under controlled temperature conditions, and later Hansen, 1939, determined that the effect of ethylene in hastening softening and other chemical changes in pears decreased with maturity, and the treatment brought about no changes that would not have occurred during ripening on the tree. Likewise, Allen, 1932, determined that the ethylene treatment hastened coloring and softening of Gravenstein apples and a number of varieties of pears, but it brought about no change in quality of the fruit from that ripened in the usual manner.

Rosa, 1928, reported on ethylene ripening of melons, and his data show no significant effect of ethylene upon ripening other than increasing coloration and softening of the tissue.

Rosa, 1925, determined that green mature tomatoes treated with ethylene ripened with approximately the same acid content as those ripened on the vine. And Hibbard, 1930, showed that celery and tomatoes did not increase in sugar content with ethylene treatment because there is no appreciable amount of reserve carbohydrates present in the tissue from which the soluble sugars could be produced with the treatment. With banana, that does have a large carbohydrate reserve, he found that although ethylene did speed up ripening it accomplished no more chemically than heat and an additional period of storage. Wolfe, 1931, after an extensive chemical study of the banana, came to the same conclusions as Hibbard. And the United Fruit Research Laboratories concluded after a thorough study of the ripening of bananas held with and without ethylene that the gas increases the rate of ripening of slow ripening fruit but has no effect upon fast ripening fruit. By a thorough chemical analysis of the fruit over a period of several years, the increase in rate of ripening was demonstrated by a more rapid hydrolysis of starch to sugar, softening of the pulp and coloration of the peel just the same as was occurring at a slower rate in the bananas held in similar storage rooms without ethylene. In every test it was found that the chemical changes associated with ripening took place in the edible portion of the banana in the same relationship to the coloration of the peel, regardless of whether the fruit was ripened in the presence or absence of ethylene.

A graph taken from a paper by Wolfe (Fig. 3) shows the effect of ethylene versus storage without added ethylene on the starch-sugar changes of quasi-dormant bananas. The reader should grasp a mental picture of this graph since the relationship shown here between the chemical changes of ethylene-ripened and normally ripened fruit hold true for most all other changes that take place in the ripening of fruits and vegetables, when the two methods are compared. Other ripening changes that may be substituted for the starch-sugar changes may be the ratio of protopectin to soluble pectin, hardness to softness, poor color to desirable color, astringent to non-astringent and so forth.

MORLOTH, 1933, reported that ethylene ripened papaws are no different from those ripened on the plant, and the treatment does not alter the turpentine taste or flavor of mangoes. And Dustman, 1934, found that ethylene accelerated the loss of green color and the softening of apples but it did not affect the chemical composition as compared with similarly stored untreated fruit.

Chace and Sorber, 1936, found that ethylene could be used to speed up the natural reactions that take place when the hulls are loosened from the walnuts, in which the kernels are

mature but the hulls remain attached. Here again ethylene brought about no changes that would not have occurred normally over an extended period of time.

In 1927 an editorial in the *Journal of the American Medical Association* suggested that the vitamin content of ethylene-ripened fruits should be watched closely, since that phase of the food value was extremely important. In response to this request, House, Nelson and Haber, 1928, reported that ethylene-ripened tomatoes were equally as rich in vitamin A and B and almost as rich in vitamin C as vine-ripened fruit. Also, fruit picked commercially mature was as rich in all these vitamins when ripened by ethylene as when ripened by any other method. Morgan and Smith, 1928, determined ethylene-ripened tomatoes to contain as much vitamin A as fruit ripened on the vine. Again, in 1930, Jones and Nelson reported that ethylene treatment had no effect upon the vitamins that had already developed in the tomato at the time it was harvested. And Clow and Marlatt, 1930, determined by feeding experiments that tomatoes ripened with ethylene were practically as rich in vitamin C as tomatoes ripened on the vine in the greenhouse. Nelson, 1931, in his report entitled "Ethylene-ripened Tomatoes Not Equal in Vitamins to Naturally Ripened Fruit," considered that fruit harvested in a commercially mature condition and ripened *in any manner* would not have the vitamin content (especially vitamin C) of fruit allowed to ripen on the vine. He found, however, that the vitamin content of the tomatoes was not altered by treatment with ethylene.

Babb, 1928, by feeding experiments determined that ethylene - blanched celery was just as potent in vitamin B as celery blanched in the usual manner, and Chace, 1934, reported that the vitamin C content of oranges is not altered by ethylene treatment. Eddy, 1934, determined by animal feeding tests that there was no difference in the vitamin C content of bananas ripened either with or without the addition of ethylene. And the writer has likewise found this to be true when estimating the vitamin C content of the fruit by a chemical method. Eddy also determined that the vitamin C content of bananas ripened by the usual methods was far superior to the vitamin C content of bananas ripened on the plant.

The effect of ethylene upon guinea pigs has been studied by Harvey, 1928, and on rats by Hirschfelder and Ceder, 1930. None of these investigators could find any harmful effects in subjecting the animals to atmospheres containing small quantities of ethylene or by placing ethylene in the drinking water. The latter workers also determined that digestive juices were not altered in their activity by ethylene. In this connection, Englis and Dykin, 1931, finding that ethylene had no effect upon pure enzymes, concluded, as have most all investigators, that ethylene acts indirectly through its effect upon living protoplasm.

Ethylene is used in concentrations of 1 part in from 1,000 to 20,000 parts of air for ripening of fruits, which is indeed a dilute mixture of the gas when we consider that Luckhardt and Carter, 1922, reported its use as an anaesthesia in concentration of 4 parts of ethylene to 1 of oxygen.

We understand from this review that there is no sound basis for the widespread belief that ethylene-treated fruit is harmful and that the grower is doing the consumer an injustice when he ripens his fruit with ethylene. Contrary to being detrimental to the consumer, anything that hastens the ripening of fruits is to his advantage, since it retards shrinkage and spoilage, conserves food value and provides for a greater and more even distribution. People are all too prone to blame ethylene ripening when the new variety of oranges that arrive on the market at the change of the season are slightly different in flavor from the overripe fruit that they have eaten the past two or three weeks. They are slow to realize that nature, uncontrolled by man, produces differences in fruit harvested from week to week.

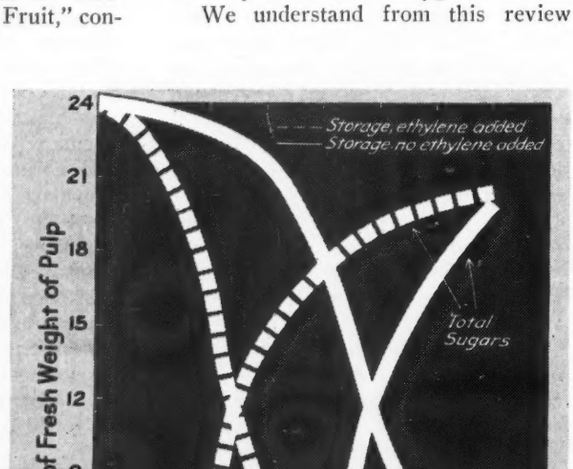


Fig. 3—Rate of ripening of bananas (starch to sugar changes) during storage at 72.6 deg. F. with and without ethylene. (From: Wolfe, Herbert S., Botanical Gazette, 92, 350, 1931.)

WE found in the previous discussion and literature review of this subject the facts that man first developed the use of kerosene and gas heat to better ripen citrus fruits and bananas. Later he discovered that the effective constituent of the heat was ethylene, and this pure gas did a more thorough job of the ripening process without causing any detrimental effects to the food value of the fruit. And finally, man has discovered that all the time nature had fooled him; that the fruit normally produced ethylene during its period of ripening and that he had only increased the amount of ethylene and therefore had only stimulated the natural processes of ripening.

The use of ethylene has been and will continue to be proposed as an agent for treating fruits and vegetables in all parts of the world. However, one need not worry as to the outcome of such recommendations since either nature, which after all controls the ripening process, or the consumer, who demands the ripened product, will control the destiny of the process. If the product is too immature it will not be ripened properly by ethylene, and if it is already almost ripe ethylene will not alter its nutritive value. If commercially mature (i.e., mature in size, firm, though possibly somewhat green in color) fruit and vegetables are harvested and held under special conditions, either with or without the addition of ethylene, the consumer need not be alarmed as to the ripeness and food value of the produce since in either case it has been ripened naturally. And it is in as good if not better condition for transportation, storage, and economic use as far as the consumer is concerned than if it had remained to the final stage of ripeness upon the plant.

INVISIBLE LIGHT Shows Up Defects in Foods

British test raw materials and finished products by fluorescence under ultraviolet light

By C. H. S. TUPHOLME
London, England

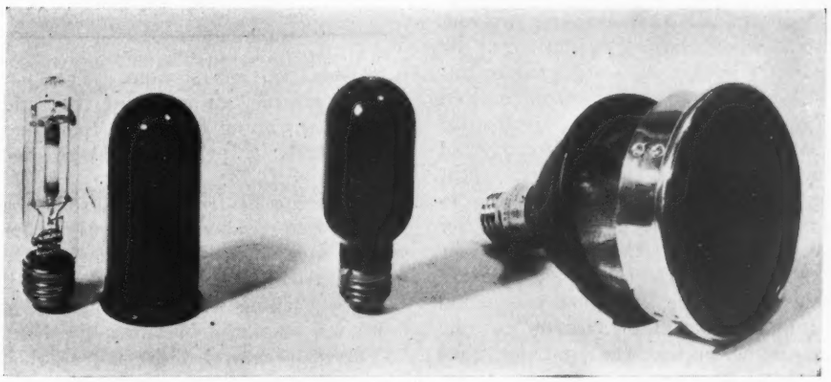
AN increasing number of food factories are employing the ultraviolet lamp as a means of testing both raw materials and finished products, the equipment for this purpose being reasonable in cost and accurate in use.

That portion of the ultraviolet band which is most biologically active lies between 3,000 and 2,000 Angstrom units. There are various methods of generating these rays artificially. The source used most extensively, chiefly owing to its comparatively low cost and convenience, is the quartz mercury-arc lamp.

The present applications of the fluorescence produced by the ultraviolet lamp are many. By the addition of known amounts of impurities to pure sugar, a scale of fluorescence can be drawn up which is well suited to qualitative determinations of sugar in solid condition. The sensitiveness of this method is so great that differences corresponding to 0.001 percent of ash content are readily recognizable. Admixture of blue dyes has little effect on the appearance under the lamp. If, however, the sugars are tested in solution, even the minutest trace of sugar coloring can be recognized by this means, since solutions of pure sugar absorb ultraviolet rays to a very small extent but colored solutions very strongly.

Milk sugar, glucose and grape sugar appear reddish. Glucose sirup has a distinct bluish fluorescence, but molasses none whatever. Bluish fluorescence in sugar solution containing fruits indicates the presence of glucose sirup. Saccharine assumes a greyish color under the lamp, but the addition of sodium hydroxide solution gives an intense violet fluorescence. The purer cane sugar is prepared, the more pronounced becomes the violet color.

Apple pulp can be detected in jams such as raspberry, strawberry and gooseberry. And turnip pulp, sucrose, molasses and glucose can be detected in apple pulp.



Westinghouse

Mercury-vapor ultraviolet lamps with quartz inner tube for bringing out fluorescence. Left, 100-watt unit with heat-resisting red-purple filter. Center, 100-watt lamp with heat-resisting red-purple glass bulb that eliminates need for filter. Right, 100-watt projector type lamp with lens and reflector; also a clip-on red-purple filter.

In brewing, it is possible to distinguish by fluorescence the several different grades among barleys otherwise apparently of one crop. The components, sorted according to fluorescence, show different biological behavior and differ in chemical composition. Another use of the lamp in brewing is for the irradiation of yeast (with unfiltered rays), leading to a reduction of 25 percent in the time required for primary fermentation and 40 percent in the time of maturation. And the yeast yield is increasing by 100 percent. Irradiated wines are improved in color, taste and bouquet.

It is possible to determine the age of eggs by means of fluorescence by comparing the watery solution of the albumen with standard gelatine solutions (0.1 to 10 percent), the fluorescence increasing according to the age of the egg. Frozen eggs give a more reddish fluorescence under ultraviolet than fresh eggs, and the preservation of eggs can be detected by painting them with a solution of a dye which fluoresces in alkaline solution, such as eosin or fluorescencein.

Wheat and rye flours display a weak bluish fluorescence. Barley and potato flours show no fluorescence when placed under the lamp, and their addition for breadmaking manifests itself in the consequent weakening of the fluorescence. Leguminous flours show characteristic fluorescences under the lamp, pea meal showing rosy red and bean meal greenish blue. As little as 2 percent of the flours added to wheat flour is immediately evident on test. Poisonous seeds are readily detected in wheat; as little as 0.3 percent of zinc oxide can be detected and addition of 1 to 4 percent of soybean flour gives a striking difference in the fluorescence color. The detection of added eggs can also be made, two eggs per pound of flour being at once evident. The examination of other extracts of flours will give evidence as to whether they have been treated with nitrogen peroxide or chlorine compounds. Wheat giving a better flour and having a high gluten content gives a characteristic bluish fluorescence when examined in cross section, while inferior wheat has a yellowish color. The age of wheat and many

(Turn to page 73)

WAR BRINGS NEW METHODS To British Food Industries

Progress and research continue despite the fighting

By ERIC HARDY
Liverpool, England

WAR has stimulated the British food manufacturing industry, because the loss of food supplies from Denmark and Holland, which were a large contribution to the national larder, has laid greater importance upon the American and Empire imports and the ingenuity of the home industry. The suggested importation of canned reindeer meat from Canada will, if carried out to any large extent, more than justify the famous Mackenzie River reindeer farming experiment which copied the Alaskan scheme. National production of mutton bacon or "macon" at the beginning of the war has now gone back to its origin in Scottish peasant life, largely because the food shortage did not materialize to anything like the serious extent which false propaganda has suggested. An increased acreage of rye will aid the biscuit manufacturer if there is a wheat shortage, but no more wheat is to be used in animal feeds. Also, there are bound to be boom prices for those who can ship foodstuffs to Britain.

Apparatus has recently been devised for electrically thawing frozen meat, equipment has been developed for grading fish according to size, and latex compounds are being used in the preservation of certain foods. Also, many centrifugal machines have come into use in the food industries, particularly 48 in. machines electrically driven at 950 r.p.m. and 26 in. machines belt-driven at 1,200 r.p.m. These are equipped with either perforated stainless steel baskets or vulcanized steel baskets with gauze lining. They are used for frozen eggs, bread for sausage, coffee essence, milk sugar, dried milk, potato crisps, baked potato flakes (these have become a leading food product), for separating sediment from such products as medicated wines, and for recovery of liquor from salts.

The Department of Scientific and Industrial Research has concentrated on the preservation of "fresh" properties in unprocessed foods during storage and transport. Among these problems has been the importation of chilled beef from overseas in controlled CO_2 gas storage. This permits transport of meat for thousands of miles without freezing. Such meat commands a price advantage over frozen beef.

Wastage of fruit in transport has also been studied. Oranges, grapefruit and apples have been destroyed by "sweating disease" caused by faulty packing without adequate room for air ventilation between the fruits. The temperature of the ship's hold is an important factor in fruit wastage in transport, as variations encourage bacteria and molds. Gas storage of pears, apples and broccoli, on land and at sea, has considerable advantage under these conditions.

Special attention has been given to fish storage and preservation. It has been shown by experiments in Scotland that, with the best conditions of storage and cleanliness, fish cannot remain "fresh" in ice more than 11 or 12 days, and under ordinary trawler conditions at sea the maximum is 6 to 7 days. Installation of brine freezing equipment and cold storage on long-distance trawlers has permitted longer journeys and bigger catches. Brine freezing is a rapid process and thus avoids the injury that occurs to fish when frozen slowly in air. By a combination of salting and cold storage, better-flavored mild-cured herring and other fish are produced, with stronger appeal to the housewife. It has been found that herring and whitefish, after rapid freezing in cold brine, retain their best quality for three months when stored at low temperature.

On the metallurgical side there has been an important advance in the introduction of a new method of electrodeposition of thick coatings of tin. By means of it, tin coatings of any desired thickness can be placed on iron, mild steel, copper or cast iron vessels at reasonable cost. The tin is so fused to the base metal that it is impossible for flaking to occur.

An interesting piece of apparatus recently introduced into Britain from France is a double purpose conditioner for fruit and vegetables. It can either moisten or dry the product so as to bring it to the best possible condition for keeping in a fresh state, and can also sterilize. It consists of a sheet metal cabinet with inner lining of asbestos. A large air vent at either side of the top leads to an air duct down the sides of the interior, ending halfway down in a valve regulated from the outside by a lever. A motor-driven fan is used to circulate air in the cabinet and for ventilation. Steam coils supply the heat and a water spray provides humidification. Produce to be treated is placed on trays, the trays are put on trucks and then moved into the cabinet, or in the smaller size trays are slipped into shelves into the cabinet.

In normal drying, a constant air flow is maintained through the drying cabinet with both air valves open, and steam is admitted to the heating coils, the temperature being controlled by regulating the outlet valve. When the fruit is merely to be pasteurized or sterilized, there is a circulating air current inside the cabinet and the outlet valve is kept closed. In this case both sets of coils provide heat, and humidity can be controlled by means of the water spray. Normally, an hour to an hour and a half is sufficient for drying, but this depends upon the produce handled.

Until brought into the war, the Danish government's experimental dairy had been working on an important invention concerning butter packing. In this method, the butter is filled into casks or cartons from a churn, the inside temperature of which can be regulated from the inside to give the butter a semi-fluid consistency without harming its quality. A special measuring tank with built-in temperature and pressure gages was constructed. From this the butter was tapped into the containers and weighed to the accuracy of a gram. After a day in cold storage the butter is extraordinarily fine and firm.

Hints and Hurdles

Scientific Research a "Must"

PROGRESS throughout centuries has replaced the old and obsolete with the new and modern. During the last decade the pace has been rapidly accelerated. New products, the result of improved processes and better methods of merchandising, have encroached on the markets of old products. Food has been no exception. Cases are many. And almost always scientific research has produced the improved product.

The introduction of hydrogenated vegetable oil shortening with its lengthened shelf life and greater immunity from rancidity took a toll of the market for lard:

	Pounds	Value
Lard		
1927	1,794,635,000	$234,863,633
1937	1,034,927,000	126,331,478
Shortening		
1927	1,239,087,000	142,576,674
1937	1,574,572,000	184,505,604

Source: Census of Manufactures, Department of Commerce.

Now, relief from the major weakness of lard is promised. Swift & Co., thanks to years of scientific research, has discovered a method of preventing the development of rancidity in lard. To Swift's new lard "Silverleaf" brand—"the bland lard"—is added less than one-tenth of 1 per cent of gum guaiac, derived from the sap of the West Indies guaiacum tree.

It is not at all singular that the threat to the lard market should be the result of scientific research, nor that promised relief from the industry's big problem should also come from the research laboratory. That so few food manufacturers have recognized the advantage of scientific research is, however, singular. Scientific research is a "must" weapon in today's battle for markets.

Returned Bottles Again Issue

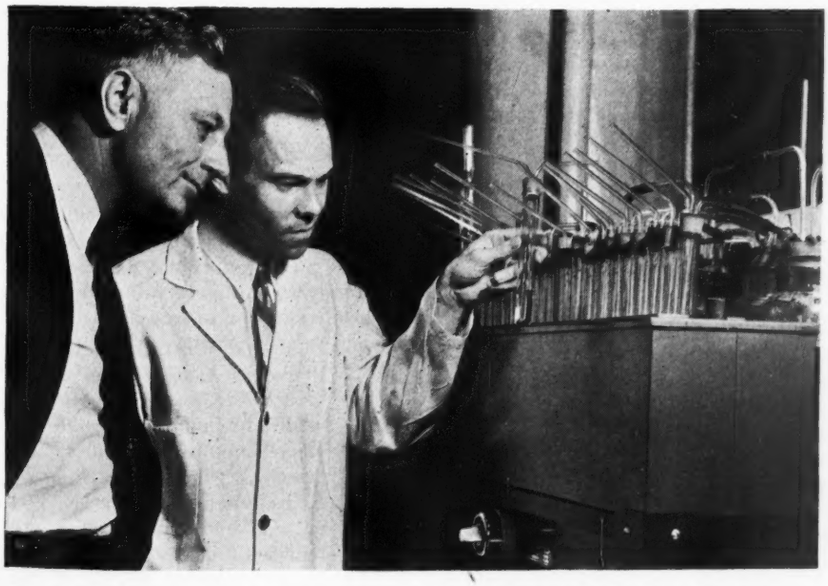
AT THE MEETING of the resolutions committee of National Association of Retail Grocers of the United States, June 17, in New York, the following resolution was passed: "That the National Association of Retail Grocers . . . again go on record asking for the elimination of the returnable empty wherever possible, that bottlers pay a compensation to the retailer for this work he does for the bottler, and that on new products coming on the market, we ask manufacturers to have the container become a part of the purchase price."

Carbonated beverage sales have increased 35-fold in the last ten years. This increased volume has reached the public largely through two types of outlets: retail grocery outlets and roadside stands. The increased sales of carbonated beverages to the grocery stores has measurably increased the service burden of the grocer. But would the grocers part with carbonated beverage sales and traffic stimulation to avoid the inconvenience of handling empties? Hardly.

The grocers asks for a non-returnable bottle for carbonated beverages. This sounds simple, but isn't. While the bottle manufacturers might welcome increased bottle sales, it is doubtful if they could supply a demand for 20 to 40 times the present carbonated-beverage-bottle output, especially in view of a probable increased demand by canners for glass if the preparedness emergency requires curtailment of tin.

The other alternative, according to the grocers' association resolution, is added compensation to the retailer. Any merchandiser knows the sales resistance to increasing the price of a popular nickel seller—especially to as much as 6 or 7 cents. It isn't being done. Compensation, if provided, would therefore necessarily represent additional manufacturing costs. If carbonated beverage manufacturers maintain a 5-cent price, absorb the cost increases which must result from our investment in preparedness and break even, they are fortunate.

Where any relief from the handling of returnable empties, or any appreciable compensation to the grocer for the service, is to come from is a difficult problem to solve—especially during the next few years.



Dr. R. C. Newton (left), chief chemist, and Dr. D. P. Grettie, Swift & Co. Research Laboratories, making tests demonstrating the stability of lard made by a new and revolutionary process which they discovered.

Claims the FTC WON'T LET YOU MAKE

A check-list of Federal Trade Commission taboos in food advertising

Part II

By NATHAN R. ABELSON
Advertising Regulations Consultant, New York, N. Y.

Flavorings and Food Colorings

To cease representing that:

The product, a yellow coloring preparation, contains egg in greater proportion than is in fact present.
(Reuben-Richards Co., Inc., "Richards Danish Vegetable Base-N-For Noodles," Stipulation No. 2419)

The product improves with age.
(Mystol Mfg. Co., Stipulation No. 02137)

To cease:

Use of the word "Maple-X" implying that the product is derived from the sap of the maple tree.
(Nelson A. Frazar, Stipulation No. 2417)

Representing that all Federal and State pure food laws permit the usage of the product or of any similar color preservative in the preparation of any articles of food in a manner whereby inferiority is concealed.
(Reuben-Richards Co., Inc., "Richards Danish Vegetable Base-N-For Noodles," Stipulation No. 2419)

Malted Milk and Milk Syrup

To cease representing that the product:

Helps build resistance to colds, winter ailments or other infections unless limited to its use as a nourishing food.

"Controls normal weight."

Will put you back on your feet "quicker than anything else."

Will reduce weight, without regard to caloric intake or unless limited to its use as a nourishing substitute for a heavier meal as part of a weight reducing plan.
(Horlick's Malted Milk Corp., Stipulation No. 02126)

Is a body builder, a stimulant for the appetite, gives one strength, energy or red blood, enables one to resist colds or other ills, or builds up vitality or weight.

Is a chocolate syrup or chocolate milk amplifier, or with milk makes a chocolate drink, or in any other way representing that the product is chocolate.

To cease representing that:

All persons need the iron or copper content of the product. A spoonful of the product will triple the iron content of a glass of milk.
(Wallerstein Co., Inc., "Bosco," Stipulation No. 02329)

Meat

To cease representing that:

Meat cured or treated with "smoked salt" will be or is subjected to smoke.

"Smoked salt" does all that an old smokehouse does in the curing or smoking of meat.
(Smoked Products Co., Cease and Desist Order No. 2783)

Meat Tenderizer

To cease representing that the product:

Enables one to serve the "tenderest meat in town."

Shortens cooking time by a definite percentage or "insures" customer satisfaction.

To cease representing that:

With the use of the product, every portion of meat may be cut with a fork.

Leading university professors drink bottle after bottle of the product or report that it is as harmless as pineapple juice, unless qualified to show that a few professors have done so.
(The Perfect Mfg. Co., "Tendra," Stipulation No. 02283.)

Oleomargarine

To cease:

Use of the words "churn," "churned," "sunlit churnery" or any derivative of the word "churn," or the picture of an old-fashioned dasher churn, implying that the product has been churned through the process by which butter is made from milk or cream.

Use of the terms "fresh pasteurized milk" or "pasteurized milk" or any other words signifying milk which do not clearly reveal that the milk referred to is not whole milk, when the milk so used is other than whole milk from which no part of the cream or butterfat content has been removed.

Use of the word "milk" to describe milk remaining after any part of the cream or butterfat has been removed, unless the word "milk" is qualified by a word which clearly reveals that the "milk" referred to is not whole milk but "skim" or "skimmed" milk.

Representing that the product contains 43.8 percent or any other percentage more "milk solids" than butter or than other spreads for bread; contains any appreciable quantity of "milk solids"; that the food value of the product is attributable to the "milk solids" content, which gives the product more food value than butter.
(John F. Jelke Co., Inc., "Good Luck" oleomargarine, Cease and Desist Order No. 3347)

All of the advertisements and advertising literature of Best Foods, Inc., for "Nucoa" oleomargarine, contain misleading and deceptive statements regarding the process of manufacture and content of respondent's oleomargarine.

As a portion of such statements so made and used by the respondent as to its said product and its method of manufacture appear the following representations of similar meaning:

1. Published illustrations in color, showing, among other things, "Nucoa" oleomargarine colored yellow in imitation of butter.
2. Representations that oleomargarine "is a fit food for children".
3. Representations that said product is "churned in fresh, pasteurized milk."
4. Representations to the following effect: "As a spread for bread and as a fat for cooking, wholesome margarine and but-

ter are equally delicious and nutritious (both yield 3,400 calories—food-energy units—to the pound)."

Thus, Best Foods, Inc., represents that its product is yellow in color and, in part, is made from whole milk; that is, milk from which no part of the cream or butterfat content has been removed. Respondent's product is not made at all from whole milk but in part from skim or skimmed milk, that is, milk from which the cream or butterfat content has been removed.

The expression "churned in fresh pasteurized milk" used by the respondent implies and is understood and interpreted by a substantial portion of the purchasing public to mean that said oleomargarine is made from whole milk as that term is herein above described.

The word "churned" has long been associated by the general public with the process by which butterfat is extracted from cream taken from whole milk in the process of butter making. In truth, respondent's product does not contain butterfat extracted from whole milk or cream by "churning" as "churning" is done in the process of making butter, nor is said product "churned" in the sense that the term "churned" is understood by the public.

The representations that oleomargarine "is a fit food for children" and that "wholesome margarine and butter are equally delicious and nutritious" are not true unless vitamin A is added to said product in sufficient quantity.

(Best Foods, Inc., Complaint No. 3545, August 20, 1938.)

MY! HOW DIFFERENT NUCOA IS FROM OLD-TIME MARGARINES! IT TASTES DELICIOUS — SO SWEET AND FRESH!
YES—NUCOA IS MADE FROM PURE VEGETABLE OILS CHURNED IN FRESH PASTEURIZED SKIM MILK. SO DIGESTIBLE! AND NUCOA SUPPLIES VITAMIN A!
EVERY POUND OF NUCOA CONTAINS OVER 7,500 UNITS OF PRECIOUS VITAMIN A! WINTER OR SUMMER, IT NEVER VARIES! EVERY POUND OF NUCOA CONTAINS 3,300 FOOD-ENERGY CALORIES, TOO—AS MANY AS THE MOST EXPENSIVE SPREAD FOR BREAD!
NO WONDER PEOPLE SWITCH TO NUCOA—AND SAVE MONEY!
THE WHOLESOME "THRIFT SPREAD" FOR BREAD ...SAVES YOU MONEY ON EVERY POUND!
For the table, tint Nucoa golden yellow—with the pure Color-Wafer in each package. For cooking, use Nucoa as it comes—natural pure white. Nucoa has a deliciously smooth, "workable" texture—easy to cream and to spread.
CHURNED BY THE BEST FOODS, INC., MAKERS OF HELLMANN'S AND B

The underlined statements are tabooed by FTC. This is a portion of an advertisement for "Nucoa" oleomargarine.

(Ho-Ro-Co Mfg. Co., Stipulation No. 02164)

Is especially indicated for those who have weak and delicate organs.

Purifies the system.

Gives vigor to the stomach.

Is good for the digestion and the stomach.

Is preferred by all those who can't digest heavy or thick oils.

(Import Oil Corp., "Gemma Oil," Stipulation No. 02147.)

Product Name and Source

Cease:

Use of the words "Italia Tonno" or the "tonno" implying that the products are from Italy.

(Southern California Fish Corp., Stipulation No. 2548.)

Use of the picturization of a Shamrock and/or the color green in connection with the word "Belfast" implying that the product is manufactured in or imported from Ireland; provided that, if the word "Belfast" is used, it shall be clearly stated that the product is of domestic origin or is not imported from or made in Ireland.

(New Century Beverage Co., Inc., Stipulation No. 2202.)

Use of the word "certified" implying that the product has been endorsed or attested in writing by a qualified independent commission as to quality, qualifications and fitness.

(Columbia Baking Co., Stipulation No. 2519.)

Olive Oil

To cease representing that the product: Is of value in cases of cramps, colic, diarrhoea or "other internal disorders."

Root Beer

To cease representing that the product:

Preserves the alkaline reserve.

Has the same alkaline reaction as orange juice and in the same manner aids in maintaining the alkaline balance.

Is healthful because it is not acid forming or is a health protecting beverage.

Agrees with foods because it is not acid forming.

(Charles E. Hires Co., "Hires R-J" root beer, Stipulation No. 02534.)

Salt

To cease representing that the product:

Is the only salt that brings out flavors in food.

Eliminates the danger of oversalting or insures best results.

Will in all cases prevent clogging or caking in salt cellars.

Insures the production of better butter with less work or that, when used to preserve meat, it insures that every particle of meat will be permeated and preserved firm with good color and no spoilage.

To cease representing that:

All other salts have a bitter taste.

(General Foods Corp., "Diamond Crystal" salt, Stipulation No. 02370.)

Sea Food

To cease:

Use of the word "lobster" or the words "lobster meat" or "lob. meat" as descriptive of a species of food fish other than that properly known as "lobster," the macrurous crustacean of the genus *Homarus*, unless the words "lobster," "lobster meat" or "lob. meat," whenever used, are accompanied, in equally conspicuous type, by appropriate language identifying the species or locality of the product.

(Hudgins Fish Co., Stipulation No. 2494.)

New Packages & Products

Trend Toward Concentrates

Many of the products which have come on the market in recent years indicate a trend toward a reduction of transportation, storage, handling and packing costs. These products are concentrates. In many of these products water has been removed from nutritive food solids, thus reducing the weight and volume to a fraction of that of the original product. Dried milk, fruits, vegetables and soups are among these concentrated products.

Another group of concentrated products are extracted from weighty bulk and concentrated to a heavy sirup or powder of considerably less weight and size than the original material. Some of these concentrates have values in addition to relatively low weight and bulk. They conserve housewives' time and effort and assure uniform results. Such a new product is "Hastea Tea Crystals," product of Tea Crystals, Inc., Lodi, N. J. Each individual serving, a pinch of ground crystals sealed in a tiny paper-backed metal-foil envelope, makes a cup of tea on the addition of hot water.

Recipes Set Container Size

To meet the demand of small families and many recipes, Borden Co., New York, is offering "Eagle Brand" sweetened condensed milk in 7½-oz. (two-thirds cup) containers in addition to the regular 15-oz. size. For use with many recipes and for small families, this new size represents an economy. Packaging for small families and one-meal use is becoming important in many markets because it offers inducement to new buyers without jeopardizing the existing market.

Modern "Old-fashioned" Puddings

Prepared puddings and desserts fit into the modern scheme of life because they save time and effort in the preparation of meals. Many new prepared desserts have found acceptance in recent years. Not a few of

the products of the large and rapidly growing prepared-dessert industry have introduced new tastes and flavors to a willing market. Old-fashioned desserts, now offered ready to serve, are also getting a fair share of the market. Two new prepared desserts based on old-fashioned recipes recently have been introduced. These are "Rice Pudding," with raisins, and "Baked Indian Pudding," made from corn meal, molasses, sugar, milk, spices and salt, both prepared by Friend Bros., Inc., Melrose, Mass. Baked Indian pudding was a favorite of early pioneers. However, in those days it might have been difficult to follow today's serving suggestion: "Serve warm with ice cream, whipped or plain cream or hard sauce."

Offers Economy Package

For the family which uses shortening in large quantities, Swift & Co., Chicago, offers an economical 3-lb. can of its pure vegetable "Jewel" brand. The can is the key-opener type with a "hinged" top—a standard shortening container. The display panel of the label is the red oval associated for years with the "Jewel" product.

For a Family of One or Two

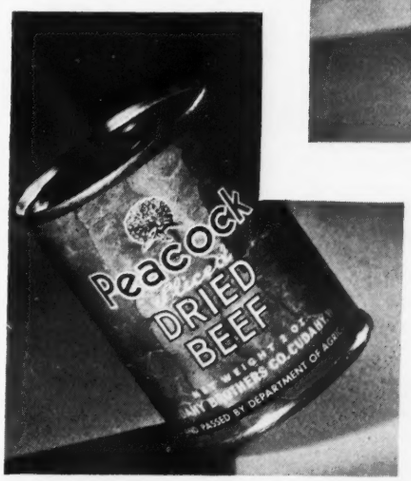
Dried beef has long been marketed in bulk and in a variety of containers —glass, transparent wrapping, etc.— designed for the average family. To meet the needs of the single individual and the family of two, Cudahy Bros. Co., Cudahy, Wis., now packages 2 oz. of "Peacock" brand sliced dried beef (chipped beef) in a buffet-size can lithographed with the appearance of the contents.

Flavor vs. Health Promotion

The soybean and its derivatives are among the oldest of man's nutritive friends, yet only in recent years has this country given more than scant notice to one of the world's most valuable foods. The soybean is high in available proteins, low in hydrocarbons, high in fat, lecithin and fatty acids. The soybean is a rich source of many vitamins, and also one of the best sources of minerals, among them calcium, potassium, phosphorous, magnesium and sulphur.

Most of the few foods on the market derived in part or entirely from soybeans stress on labels and in promotion (often exaggeratedly stated) the health and dietetic values of the product. It is refreshing, therefore to note a new toasted cracker prepared from roasted soybeans and soybean flour which emphasizes on the label the flavor and uses of the product without any reference to the health or dietetic values of the soybean derivatives in the product. This new product is "Soyas," a cracker made by Beech-Nut Packing Co., Canajoharie, N. Y.

Soyas are crisp salted crackers toasted to an appetizing nut brown color. Four of them are pictured on the front of the package.



Prepared Dessert from Tapioca

Tapioca, an old favorite base for desserts, has been a standby of housewives, even though it requires mixing, flavoring, cooking and other preparation. Standard Brands' new prepared dessert, "Royal Tapioca Pudding," provides an instant tapioca pudding dessert. To prepare the product for the table, the housewife merely adds milk and brings to a boil.

PUTS 200 STORES ON WHEELS

Bakery installs 219 trucks on one day—Boosts sales 61 percent by promotion tie-ins—Eliminates 1,000,000 route-miles a year—Saves $375 a month

Side view of the Davis company's new White Horse home-to-home delivery truck, showing particularly the low-step side entrance and the painting and lettering layout, with the advertising poster in its metal frame. Each truck is insulated and has indirect interior lighting.

Additional storage space is provided in the rear of the truck. From it are taken goods to replenish the shelves and showcases on the interior. The housewife reaches these showcases by simply stepping over the curb through the right side door. Note also the neat driver uniform and the basket used to carry a selection of goods to customers who prefer to purchase at their own back doors.

ONE of the most unusual automotive installations in the baking industry, or in any other industry, was made on April 8 by Davis Standard Bread Co., Los Angeles. This company scrapped its entire fleet and put into service a fleet of 219 White trucks. The new fleet consists of 200 home-to-home, air-cooled, White Horse delivery trucks, fourteen White Horse wholesale restaurant trucks and five cab-over-engine White tractors and trailers. The latter have 36-ft. bodies for delivering merchandise to the company's nine plants and distributing stations installed in the community surrounding Los Angeles. These distributing stations save 1,000,000 miles per year of route-truck driving.

The installation is unusual not only in the large size of the fleet but also in the fact that it was made on one day and in conjunction with the establishment of the nine new decentralized distributing stations.

Most fleet changeovers are made one branch or station at a time so as to interfere with operations as little as possible. In the Davis company case, only thorough and painstaking prior preparation made the one-day installation possible.

However, as compared with the branch-by-branch changeover, the one-day changeover provided the Davis company with the opportunity to capitalize on the event from a business standpoint by advertising and other sales methods. Just how successful this capitalization was is shown in the sales volume, which increased 61 percent in the first week of the new truck operations.

The shapely lass is not a typical Los Angeles housewife. But this view shows the interior arrangement of the natural-wood cases with shatter-proof glass in the fleet of 200 White Horse house-to-house trucks put into service on the same day by Davis Standard Bread Co., Los Angeles. Formerly, 70 percent of the women customers purchased from the basket at their doors. Now, 70 percent walk right into the truck and make their own selections. Each truck is fitted with an enclosed 10-gal. water tank (near the steering wheel), together with a chromium faucet and sink for the driver-salesman to wash his hands and clean the knife with which he cuts merchandise.

The installation also took out of service a fleet of old vehicles which were not especially designed for the house-to-house work but had to be adapted to bakery use. Also, due to the great number of different makes, a driver accustomed to one make found it unnatural when shifted to another.

Furthermore, the great variety in type and make of the old vehicles prevented any efficient degree of standardization in repair parts and maintenance procedure. This, in turn, greatly increased the cost of maintenance and repair in comparison with a fleet of all one make and type, where any given replacement part will serve any unit in the fleet and where the procedure of the replacements will be identical.

The records further showed that full depreciation had already been taken on the greater portion of the old fleet. Then, the company desired to procure more efficient operating vehicles designed for house-to-house work. And further study of the company's maintenance costs indicated that the new fleet could be depreciated and operated simultaneously at less cost than the existing cost of maintenance of the old fleet. These facts led to the decision to change over to the new standard White Horse unit at once. The many savings effected through the purchase of the equipment at one time also were a factor in making the entire changeover at the same time.

After two month's service, the Davis company states that the new White Horse fleet is being operated and depreciated or amortized at a total cost of $375 per month less than the old fleet cost to operate.

The prior thorough preparation which made the one-day changeover possible included two steps: (1) Setting up of complete standards of procedure by the company's automotive maintenance department to take care of any contingency that might arise; and (2) prior driver training. The latter consisted of a driving course held by the Davis company in the basement of the White Motor Co.'s Los Angeles branch. There, under experienced instructors, and with the aid of prepared instruction sheets, the Davis drivers maneuvered between the pillars of the large basement area under conditions simulating those of street traffic. An examination was given on starting, stopping and close control. At the end of the course, drivers who were proficient were graduated and given two certificates, one for their own use and one to post in their trucks for public exhibition.

THE sales-promotion tie-in with the new fleet installation was extensive in its scope. Advertisements were run in 23 newspapers. A transportation show for the Davis company employees and their families was staged on Friday evening, April 5. The new trucks were paraded up and down the Los Angeles streets on Saturday, April 6, and on the same day was held what is claimed to have been the longest sustained program ever contracted for in the history of radio. The program ran from 8 a.m. to 11 p.m., with 21 quarter-hour periods on the Los Angeles radio station of Columbia Broadcasting Co.

The gist of the radio story was that on the following Monday the Davis company's 237 varieties of bread, rolls, cakes and doughnuts would be delivered daily to Los Angeles homes in a new fleet of modern traveling stores, into which the housewife might step and select her goods from glass-front show cases.

The Food Industry News

Extract Manufacturers Have Record Attendance

With the largest attendance in its history, Flavoring Extract Manufacturers' Association of the United States met in its 31st annual meeting at Chicago, June 24-26.

J. W. Sale, senior chemist of the Food and Drug Administration, discussed in detail the problems of labeling as they affect the flavoring-products industry. He cited the advisory definitions and standards of the Federal Food and Drug Act of 1906 as being the guide in determining the common or usual names of flavoring extracts of the corresponding types until standards for them had been formulated under the new Act.

In reporting the findings of the Homemakers' Guild in respect to container sizes and shapes, Howard Trumbull, Owens-Illinois Glass Co., cited: (1) Looseness of fit of bottle in carton, (2) taper of bottle and (3) weight of the bottle and depressions on the two sloping sides as factors in container deception considered by government officials. Replies to questionnaires sent to 850 Homemaker Guild Consultants in 48 states showed that the 78 percent making answer gave vanilla, lemon and almond as their preferred flavors, in the order named. Brands of vanilla given were 181 in number, there were 123 brands of lemon and 110 brands of almond.

Of the vanillas, 62 percent were contained in 3 sizes of bottles, with the remaining 38 percent in 14 different sizes. Twenty-six percent of the lemon extracts were in 13 sizes of bottles and 22 percent of the almond extracts were in 12 sizes of bottles.

Study of bottle shapes showed that users of flavoring extracts rated the bottle containers on basis of pourability, amount of shelf space required and stability with reference to keeping an upright position. In respect to pourability and ease of picking up, the old-fashioned panel bottle was preferred. But, for convenience on the shelf and general utility, the bottle with a broad base and sloping sides was preferred to the straight-sided bottle with square shoulders and of the same height. All bottles had the same volume ($\frac{3}{4}$ oz.) of vanilla extract.

1940-41 production of vanilla beans from Madagascar, Comores and Reunion will be about 350 tons, as compared with 425 tons for 1939-40, according to Ray Schlotterer, secretary of the Vanilla Bean Association. In contrast, the 1940-41 crop of Mexican beans will be about 225 tons, as compared with 175 tons in 1939–40 and 110 tons in 1938-39. New crop Mexican cut beans will be available in January, 1941, and whole beans will be available in April, 1941. Puerto Rico will have about 2,000 lb. of cured beans in 1940 out of a total of 10,000 lb. of green beans. The largest users of vanilla beans are reported to have from 12 to 30 month's stock on hand.

For past 15 years, total importation of vanilla beans has fluctuated from 750,000 to 1,545,000 lb., to average 1,200,000 lb. Ice cream makers use half of the import.

Officers elected at the convention include: president, John H. Beach, Seeley & Co., Inc., New York, N. Y.; first vice-president, Frank Dodge, Dodge & Olcott Co., New York, N. Y.; second vice-president, G. M. Chapman, Liquid Carbonic Corp., Chicago, Ill.; third vice-president, W. B. Durling, Wm. J. Stange Co., Chicago, Ill.; secretary, E. L. Brendlinger (reelected), The Dill Co., Norristown, Pa.; treasurer. L. P. Symmes (reelected), Baker Extract Co., Springfield, Mass.; executive secretary, John S. Hall (reelected), Chicago, Ill.

JOHN H. BEACH

He has been elected president of Flavoring Extract Manufacturers Association of the United States.

Government is Expanding Low-cost Milk Program

Low-cost milk distribution is following the lead of the surplus commodity stamp program as an expanding method of providing food surpluses to relief families through retail channels.

The milk program already is in operation in three cities—Boston, Chicago and New Orleans. The District of Columbia has been designated as the fourth area, and New York is expected to be listed soon. Milk marketing agreements throughout the country—there are about 25 of them now—are being written to provide for this program as fast as revisions are made; half of them now contain clauses permitting inauguration of the 5- and 7-cent a quart relief milk plan.

Daily sale of 5-cent milk in New Orleans runs around 10,000 quarts, through a dozen distribution centers. In Chicago the daily sale, at 5 cents for families on the dole and 7 cents for WPA and private charity cases, is 100,000 quarts. The Boston sale averages 62,000 quarts daily on terms similar to Chicago's. Experience has shown that sales under the low-cost plan are nearly all reflected as increased distribution.

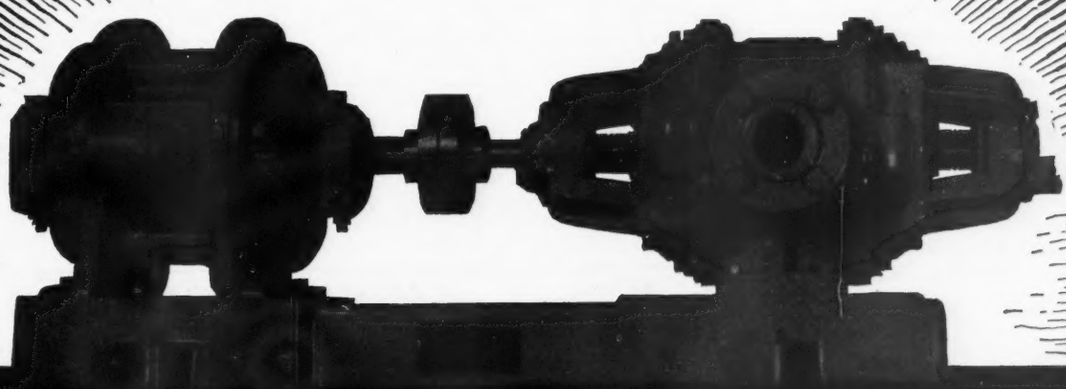
The Chicago plan has an added wrinkle, recently started, which makes available through school authorities a half-pint of milk daily for school children at a penny.

NYU Offers Course In Food Engineering

A graduate course in food engineering is being offered by the college of engineering of New York University, New York City. The general plan of the course is based upon the concept of unit operations as developed by the chemical engineer, but modified and adapted to the characteristics of food processes. Such unit operations as fluid flow and heat transfer, evaporation, baking, pasteurization, refrigeration and quick freezing, among others, will be treated. There will also be such topics as fuels and combustion, movement and storage of materials, and plant design and location.

The course, which begins in September, will be under the supervision of Dr. Henry J. Masson, professor of chemical engineering and director of the graduate division. He will be assisted by industry specialists.

CLEAN COMPRESSED AIR



Nash Air Compressors furnish clean compressed air, free from dust, heat or oil. Nash Compressors perfectly meet the need of the Food and Chemical Industries for clean compressed air for agitating, blending, moving liquids by pressure displacement, and for maintaining pressure on storage tanks.

Nash Compressors furnish clean air without supplementary filters or air washers. They are available in any capacity. Simple, efficient, and economical. One moving part, rotating on ball bearings. No internal wearing parts in metallic contact, and no internal lubrication. Ask for Bulletin D-236.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

Tremendous Tax Burdens for Industry Predicted as Result of Defense Levies

Food manufacturers are not likely to suffer much more from new taxation than will all industry. But even having much company will not lighten the tremendous new tax burdens to be expected later in 1940 and early in 1941. Buiness spokesmen in Washington fear that few of industry appreciate how tremendous the new loads are going to be. And very few have discovered that many of the new levies will be based on the earnings of 1940, even though the taxes may not be put into law until late in the year or during next year.

Congress has provided an arrangement by which executive departments can spend this fiscal year up to approximately 13 billion dollars; and if defense programs go forward as planned, nearly that much will be committed before July 1, 1941. If so, the newly increased public debt limit will be crowded closely. In any event, the income gathered by Uncle Sam's tax collectors will be several billion dollars more during the current fiscal year.

The first "defense tax" bill took effect during late June, raising corporation income tax levies, individual income taxes and several excise taxes of importance to the food business. Congress is already working on the problem of still more drastic tax legislation. The first effort will be to impose *new* excess profits taxes. Those are intended to be virtually confiscatory, and even punitive in their nature.

In view of the limited new income likely to be derived from excess profit sources, Congress is going to pass also additional taxes of other sorts. No one yet knows just what form these new levies will take. Some further increase in the income tax rates on corporations is confidently expected; and these increased burdens will probably be imposed on 1940 earnings. There is most acrimonious debate as to whether a comparable new personal income tax increase should also be imposed. Politically it is undesirable. But the Treasury realizes that further burdens on individuals must be imposed sooner or later. Naturally, fiscal officers prefer the "sooner" policy.

There is as yet little talk in Washington about a federal sales tax or transactions tax. However, that source of federal income remains the one great untouched area. It will not surprise some of the business pessimists of Washington if Congress decides that such sales taxes may have to be put on to the statute books before long. Such a levy is very unlikely until after the new Congress convenes in January, 1941; but it is sure to be debated then. Chance of enactment is uncertain.

Pickle Packers Expand Program of Research

Encouraged by results of research studies during the past year, National Pickle Packers' Association has doubled its research program at Michigan State College.

This expansion has been authorized by the Association's executive committee in keeping with suggestions made by members at the yearly meeting on June 26 in the Palmer House, Chicago. In his summarized report on the past year's work, Dr. F. W. Fabian, director of the research fellowship authorized at the June, 1939, meeting, pointed out the possibility of saving 15 lb. of sugar for each barrel of pickles made and the high nutritional value of genuine dill pickles in comparison with beets, cabbage, sauerkraut, eggplant, turnips, fresh cucumbers and the like in respect to mineral salts and vitamin and food acids content. Other factors in pickle making cited as worthy of study were salting, freshening, and finishing at a reduced cost of production.

Authorization of two fellowships instead of only one for the coming year provides for a study and evaluation of processed dills, sweet pickles and fresh cucumber pickles, if time and facilities permit, comparable to that made of genuine dill pickles.

Reports on acreage planted and June crop conditions indicated a large increase in acreage but uncertain crop conditions because of excessive rains, unseaonably cool weather and destructive pests. Forty-four reporting members, representing 59.8 percent of the industry, gave the 1940 planted acreage as 52,133, as compared with 34,399 in 1939. On a total industry basis, the 1940 planting is estimated at 87,180 acres; an increase of 51 percent over 1939.

On the basis of estimated 1940 crop yield and 1940 total consumption, the Jan. 1, 1941, carryover will be about 1,000,000 bu., as in 1939.

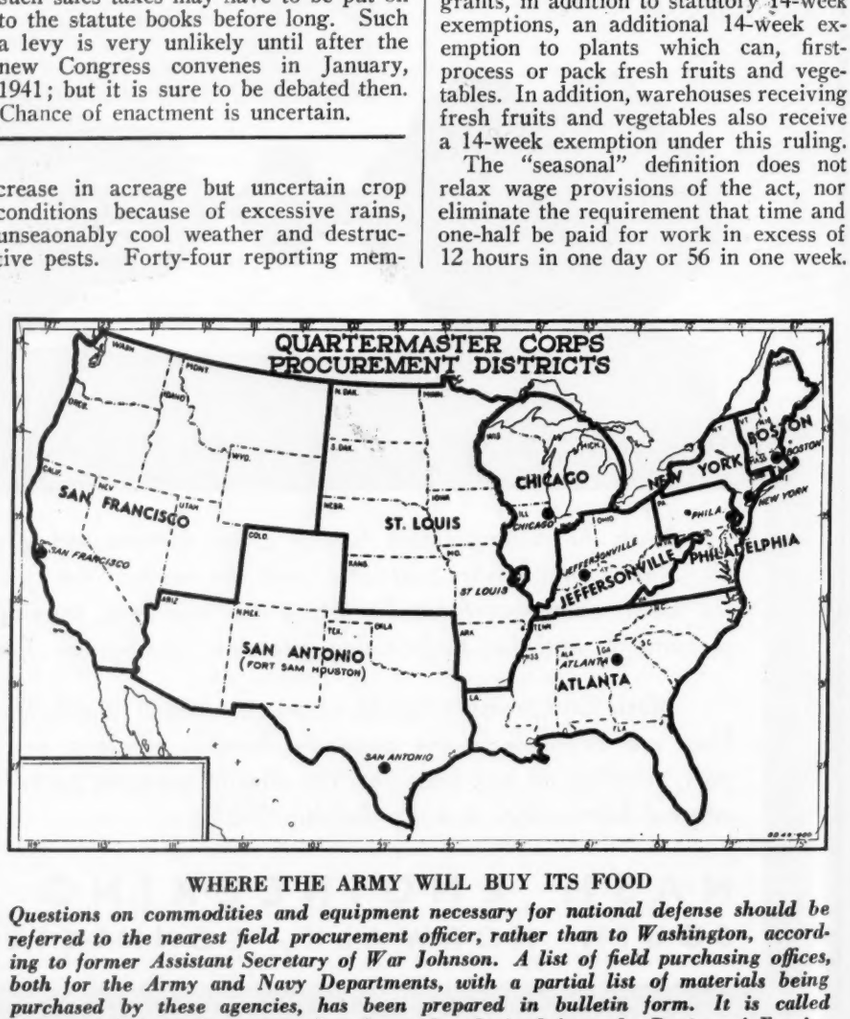
Wage-hour Restrictions Eased By New Rulings

In a dual ruling issued late in July, Administrator Fleming drastically altered the definition of "area of production" for fresh fruit and vegetable processors and granted additional workweek exemptions to similar establishments by defining them as being of "seasonal" nature.

The new "area of production" definition throws out entirely the matters of population and range of supplies. Instead it exempts all plants employing ten or fewer workers obtaining their fruits and vegetables "from farms in the vicinity." This definition will go into effect October 1.

The ruling on the "seasonal" clause grants, in addition to statutory 14-week exemptions, an additional 14-week exemption to plants which can, first-process or pack fresh fruits and vegetables. In addition, warehouses receiving fresh fruits and vegetables also receive a 14-week exemption under this ruling.

The "seasonal" definition does not relax wage provisions of the act, nor eliminate the requirement that time and one-half be paid for work in excess of 12 hours in one day or 56 in one week.



WHERE THE ARMY WILL BUY ITS FOOD

Questions on commodities and equipment necessary for national defense should be referred to the nearest field procurement officer, rather than to Washington, according to former Assistant Secretary of War Johnson. A list of field purchasing offices, both for the Army and Navy Departments, with a partial list of materials being purchased by these agencies, has been prepared in bulletin form. It is called "National Defense Procurement" and may be obtained from the Bureau of Foreign and Domestic Commerce. The map above is from this bulletin.

GEORGE M. MOFFETT

CHESTER DAVIS

Mr. Moffett, who is president of Corn Products Refining Co., heads up the food section under Procurement Chief William S. Knudsen of the National Defense Commission. Mr. Davis is the agricultural products member of the commission. According to Mr. Moffett, "There are adequate food supplies—too much of many items, and plenty of facilities for processing it." His biggest job is that of working out with the military the paper problem of food supplies for an army in the field abroad, should such a contingency arise. He acts as liaison between Mr. Knudsen and Mr. Davis.

Methods of Mitigating Wage-hour Requirements

Food industry employers have four ways of mitigating the rigid requirements of the Wage-Hour Act, although not every method is available to every plant. The four "escapes" from the 42-hour week (it'll drop to 40 hours in October) are:

1. Pre-payment of wages or "time off" to build up an hourly reserve for peak periods.
2. Six-month, 1,000-hour contracts.
3. Exemption through meeting the definition of seasonal operations.
4. Exemption through meeting the definition for "area of production."

Of these, the first two are available to all employers. Permission to use a pre-payment plan was given by the Wage-Hour Administration in a new interpretation of the Act promulgated in July.

Under the pre-payment system, employers pay workers more each week than they have earned, thus building up a reserve of "overtime" due to the employer. When a rush job requires overtime, the extra hours are charged off against the reserve. It is important to note, however, that in charging off such overtime, pay for time and one-half must be allowed.

A variation of this same purpose is available in plants operating on a bi-weekly, semi-monthly or monthly pay period. In such establishments, when employees work overtime during the first part of the pay period they may be given time off calculated at time and one-half during the remainder of the pay period to maintain the wage paid at a stated level.

The six-month, 1,000-hour contract plan permits employers with such agreements to disregard weekly working hours during the contract's life, just so hours worked do not exceed 1,000 for the entire period. For the six months of a year for which there would be no hours-exemption contract, the regular weekly hour limit would apply. The ruling also permits two six-month, 1,000-hour contracts, but if this is the case, the 1,000-hour limit must be observed over all intermediate periods of 26 consecutive weeks, as well as for the specific periods of the contracts. Annual contracts for 2,000 hours also are permitted.

New Cold-pack Regulations

Elaborate regulations under the Warehouse Act have been promulgated by the Secretary of Agriculture. These new rules govern warehousemen in storing cold-pack fruit, and give definitions of the grades and handling requirements which must be observed by owners in storing these food products.

Can Sizes Approved

New can size approvals are announced by the Bureau of Standards. Approximately 90 percent of the annual pack of fruits and vegetables goes into 18 standard can sizes. There are 19 other cans designed for a single commodity only, out of the total of 41 recognized can dimensions.

FAA Has Been Abolished

Any industry requiring alcohol permits now must deal with the Alcohol Tax Unit of the Bureau of Internal Revenue. The Federal Alcohol Administration has been abolished. Permit proceedings can be conducted with the deputy commissioner in Washington or with district supervisors who have now been given authority to "issue, amend, deny, revoke, suspend or annul" such basic permits without reference to Washington.

FSA Gets Under Way on Food Standards; Takes Action on Several of the Dockets

With July 1, the task of supervising the Food and Drug Administration became the job of Mr. Paul McNutt, Administrator of the Federal Security Agency. In this task he is being assisted by the assistant administrator, Mr. Wayne Coy, and the assistant to the administrator, Miss Mary E. Switzer.

Under the Administrator and his principal assistants is a legal division headed by the General Counsel of FSA. That post was filled during July by a new appointee, Jack B. Tate, a former associate general counsel. Under Mr. Tate there will work a group of attorneys formerly in the Solicitor's Office of the Department of Agriculture. Those men, long experienced in food and drug work, will become part of the legal staff to handle all formal proceedings and court actions for Administrator McNutt. This group of experienced specialists continues under the immediate supervision of P. D. Cronin, long the head of the comparable unit in the Department of Agriculture.

At this stage it is desirable to review the exact status of all pending standards and the prospect of new work. Here is about the way Washington sees it:

1. The first standards order signed by Mr. McNutt was a routine matter fixing a definition and standard of identity for dried skim milk under Docket 7E. That standard was promulgated in the *Federal Register* of July 12 and become effective October 10.

2. The balance of Docket 7 formed a group of four orders giving definitions and standards of identity for cream, whipping cream, evaporated milk and sweetened condensed milk. That group of orders was the last of those handled by Secretary Wallace, being signed June 28 and published in the *Federal Register* of July 2. They become effective September 30.

3. Three sets of revised standards appeared late in June: The modification of the canned tomato definition (described in detail last month in Food

INDUSTRIES); the modification of the dimensions fixed for canned asparagus tips; and the modification of the canned cherry standard permitting the term "tart" to be used instead of the word "sour."

4. In mid-July there remained incomplete three parts of Docket 10 covering fruit jams, fruit jellies and fruit butters. These then remained in the status of examiner's findings without ruling of the Administrator. Eleven briefs were filed by interested parties protesting one or more details of the examiner's findings. These briefs came from the National Preservers Association, the attorneys of the sugar refiners, one sirup company, one corn products company, the wholesale grocers, the Canners League of California, and five different preserving companies. Since the question of the sweetener controversy is involved here, the Administrator of FSA must review this docket with great care before the final order is issued.

5. Another group of incomplete standards proceedings were the three parts of Docket 11, Docket 12 and Docket 13 which related to five varieties of cheese. Although the final date for brief filing expired last December, the examiner's findings and tentative proposal for standards had not yet been issued in mid-July. It was expected, however, that the cream cheese decision, Docket 12, might be issued soon, possibly before August 1.

6. New dockets are required to initiate standards proceedings on dietary foods (vitamin fortified) and on various flours. Proceedings in those cases were started in April but canceled in order that there be no hybrid handling, partly by the Department of Agriculture and partly by FSA. In mid-July it was a bit uncertain just when those subjects could be reopened, but presumably the actual hearings would not begin until well after Labor Day.

7. The canned fruit case, originally Docket 5, has been reopened and a new docket and set of hearings will be initiated by FSA. Certain sugar interests took the Secretary of Agriculture into the Circuit Court of Appeals protesting the original standards. Numerous other vigorous actions were taken by other interested parties. As a result, the Secretary of Agriculture asked the court to return the entire case to his Department in order that a further hearing may be held on the controversial sugar issue. On July 15 the published statement of FSA announced its plan for carrying out the program. It also at that time announced its acceptance of the previous Department of Agriculture ruling that the tentative standards normally in force would not be rigidly applied with respect to the controversy over quantities of sweetening agent prescribed. Since that is the issue in the new hearing to be held, it is the intention of FSA to withhold any prosecution of cases involving this issue until after final determination is made. In effect, renewal of activity will take substantially the same form as if this were a new docket on a new commodity.

8. Rules of practice in standards hearings have been significantly modified for further proceedings. In the *Federal Register* of June 26 the Secretary of Agriculture published the modified regulations which will govern also under FSA. The new rules are intended to speed up proceedings. Perhaps most important is the ruling that when a tentative finding of fact and proposed order are issued, this will be the preliminary action of the Administrator, not merely a finding by the presiding officer. However, there will be the same opportunity for protest and the filing of briefs thereafter as formerly.

Want Macaroni Declared A Surplus Commodity

In a petition to the Secretary of Agriculture, National Macaroni Manufacturers' Association has requested that macaroni products and egg noodles be placed on the list of surplus commodities for blue stamp marketing. This action was taken at the close of the association's 37th annual meeting in Chicago, June 24-25.

J. J. CUNEO

Although macaroni and egg noodles are not agricultural products in themselves, they consist almost wholly of ingredients representing agricultural products available in surplus proportions. Because of this surplus condition, the normal market spread of 6 cents per bushel between amber durum wheat and dark northern spring wheat no longer exists.

M. H. Thatcher, President of Farmers' National Grain Crop., reported that 92 percent of U.S.A. durum wheat growers are complying with the government crop loan program; also that the export markets for durum wheat and flour and for semolina are gone because of war conditions. He further reported that crop conditions in durum wheat growing areas were very poor and that the 1940 crop is likely to be light.

In his report, President J. H. Diamond stated the volume of macaroni products business had dropped during the past year, that the margin of profit had become zero, with a decrease in product quality, that last year macaroni plants were being built and modernized whereas this year plants are for sale; and that deceptive containers are an industry problem.

In the interest of improving product quality, the use of durum flour clears running over 1 percent ash was denounced. Increased use of fancy No. 1 semolina was recommended, with suggestions that separate contracts be negotiated with millers for semolina, durum fancy patent flour and any durum flour under 1 percent ash; also, that the number of types of semolina, granulars and durum flours to be contracted for be reduced from many to only three.

After weighing the advantages against the disadvantages of vitamin fortification of macaroni products, Dr. Howard J. Cannon, director of the Laboratory of Vitamin Technology, Chicago, indicated that the macaroni manufacturer had little to gain through vitamin fortification.

As a follow up on his report as research director, Dr. B. R. Jacobs prepared a petition to the Food and Drug Administration to recognize a 30 percent variation in the fill of containers as a step in eliminating "slack fill" containers. At present and previously, there has been a variation of 40, 50 and even 60 percent in the volume of containers containing the same weight of product. Shaking down and settling during handling is partly the reason for this variation in package fill. Variation in shape of pieces packed in the same style and size containers is another factor. Finally, some manufacturers use a 16-oz. container for an 8-oz. package in an endeavor to keep container inventories low and to get the lowest price for quantity purchase of containers.

New officers elected at the convention include: president, J. J. Cuneo, La Premiata Macaroni Co., Connellsville, Pa.; vice-president, C. W. Wolfe, Megs Macaroni Co., Harrisburg, Pa.; secretary-treasurer, M. J. Donna (reelected), Braidwood, Ill.; research director, B. R. Jacobs (reelected), Brooklyn, N. Y.

Charges Lecithin Monopoly

Federal Trade Commission charges that American Lecithin Co. and certain affiliated firms and individuals are engaged in "a combination and conspiracy to monopolize trade and restrain competition in the purchase and sale" of lecithin. That chemical is an important component in candy, margarine, shortening, certain food fats and oils, biscuits and crackers, and a number of other food commodities. Reply to the Commission's complaint by those charged with monopolistic practice was due about August 1.

Answers to Food Law Questions

Interpretative Opinions from F&DA Letters to the Industry

More information regarding labeling, composition and other regulatory phases of food materials is available in the following informal rulings of the Food and Drug Administration. These abstracts continue the series which began in the April issue of FOOD INDUSTRIES.

152. *Silver dragees* sold exclusively for cake decoration are not considered to be confectionery; conditions of use must preclude their consumption as confectionery.

153. Labeling of *confectionery* must be on top of box, though a continuing panel onto side of box is not regarded as misleading; the bottom of the box is not regarded as satisfactory, even with a sticker on box top directing attention to bottom; an ingredient which may be present in any one package must be specifically named on all packages; artificial color or flavor must be declared if any is used.

154. *Sodium bisulphite* added to *candy* should be declared as an ingredient and as a chemical *preservative.*

155. Cake *decorations,* when sold as such, may be subject to label regulations: Candle holders are not primarily confections, and need not be labeled as a food; birthday-cake letters do constitute confectionery and packages should bear mandatory label information.

156. Confectionery *containers* filled at customer's direction in retail store are not subject to Act unless subsequently shipped interstate.

157. Canned field *corn* may be labeled "yellow variety" or "white variety," but the word "golden" is not sanctioned because of possibility of consumer confusion with sweet corn.

158. An ingredient statement on peanut butter *sandwiches* is satisfactory if it merely declares type of *cracker* used instead of naming ingredients used, provided consumers were not being denied information to which they were entitled.

159. *Shipments* of food, drugs and cosmetics to the Canal Zone, Puerto Rico, or the Virgin Islands are in interstate commerce; shipments to Hawaii or the Philippines would be treated as to a foreign country; however, the *manufacture* of an adulterated or misbranded food, drug, device or cosmetic is prohibited by the Act in any territory.

160. A *coal tar color* used for therapeutic value rather than as a color has the same status as any other drug product and need not be certified. (This applies to food colors also.)

161. Shipping *container* should bear mandatory label information if it is likely to be used by consignee for display purposes.

162. The name of a holding company that distributes products manufactured and sold to it by its wholly owned subsidiary should appear on the label as *distributor,* not as manufacturer; the use of a *trade-name* on a label is unobjectionable if the individual who so operates assumes full responsibility.

163. A blend of cane and maple *sirups* need not indicate percentage unless maple is less than 25 percent; if less than 10 percent, product should be labeled "Sugar sirup with a trace of maple sirup added"; if any invert sugar is used, it should also be declared as an ingredient.

164. Label declaration of salt or citric acid is not required if *crabmeat* is thoroughly drained after dipping in acidified brine and then "dry packed."

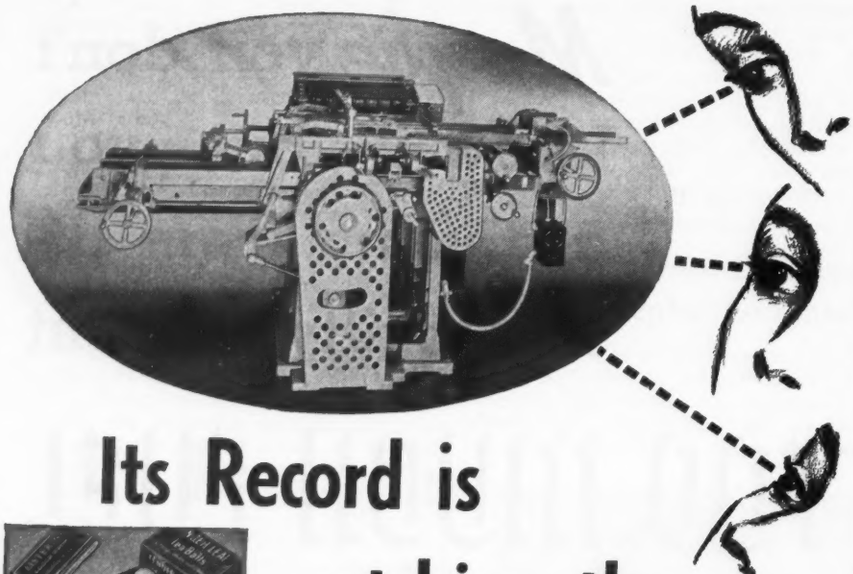
165. *Confectionery* sold by the piece (or as so-called "penny goods") need not be labeled, but if wrapper constitutes a label, complete labeling is necessary.

Maybe you don't know it – but – you are using from fifteen to fifty per cent

TOO MUCH FUEL

. . . that is, if you're baking bread, if you are roasting nuts or cocoa . . . if you are cooking hard candies —in general if you employ high temperatures in your processes. ★ The Kemp Industrial Carburetor, which premixes gas and air for complete combustion will correct this condition for you. And, for good measure, Kemp gives you automatic control, laboratory accuracy and wider turn-down range. ★ Our resident engineer in your section will be glad to show you just how these general statements will apply to your specific problem . . . to tell you whether you can save fifteen per cent of your fuel, or fifty per cent, or something in between. Tear out this ad *now,* and have your secretary write **The C.M. Kemp Manufacturing Co., 405 E. Oliver St., Balto., Md.**

KEMP of BALTIMORE



Its Record is catching the eye of many a manufacturer

Manufacturers who keep up with the times, who pride themselves on recognizing *value* when they see it, are eyeing with interest the performance record of our FA type machine.

Already being used by more than a hundred manufacturers, the FA is really *doing a job!* In plants producing items put out in many different sized packages, the FA is wrapping the entire line efficiently and economically. Its extremely wide size range makes this possible.

The FA's versatility is strikingly illustrated by the picture at left which shows only a few of the many styles of wrapping it produces. In addition to ordinary cartons, this machine handles extension-edge boxes, open boats and turned-up-side trays.

Uses any type of Wrapping Material

May be equipped to use any type of wrapping material — transparent cellulose, glassine, foil, waxed paper, or plain paper wrappers. Printed material may be used in economical roll form, with printing registered accurately by Electric Eye.

These few facts about the FA show why it is being so widely acclaimed by manufacturers in many different industries. Undoubtedly, you will want to know more about this remarkable machine.

Four sizes of Salada Tea packages wrapped on the FA

Consult our nearest office or write for literature.

PACKAGE MACHINERY COMPANY, Springfield, Mass.

NEW YORK CHICAGO CLEVELAND LOS ANGELES TORONTO

Mexico, D.F: Agencia Comercial Anahuac, Apartado, 2303
Buenos Aires, Argentina: David H. Orton, Maipu 231
Peterborough, England: Baker Perkins, Ltd.
Melbourne, Australia: Baker Perkins, Pty., Ltd.

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

166. *Fish* and fillets when labeled must declare species; quantity-of-contents statement is not necessary where weight of individual pieces varies, if container is appropriately marked for weight and individual fish weighed when purchased; wrapper should state whether product has been frozen.

167. Pending promulgation of standards, cocoa may be substituted for chocolate in flavoring *ice cream.*

168. *Carbonated water* with small amount of added mineral salts is not entitled to exemption from ingredient declaration granted to carbonated beverages; the name "Club Soda" is acceptable for such a product.

169. The name "Concentrated Orange Juice" is applicable only to orange juice free from excess orange oil, concentrated by heat; any added ingredients would make a product which might be termed a "beverage base."

170. A mixture of two standardized vegetables may be designated simply by the common name of each, as "Carrots and Peas" (or "Peas and Carrots," depending upon which vegetable predominated).

171. If a sugar cane *sirup* is partially inverted, the label should so state; "Rock Candy Sirup" should be applied only to sirup remaining after crystallization of rock candy; quantity of contents of sirup containers should be in terms of fluid measure, but net weight may also be stated.

172. If artificial color is used as an optional ingredient in standardized canned peas, it must be declared on the label.

173. The use of *tags* as labels on containers of shucked or shell oysters is satisfactory provided mandatory information is given on tag.

174. Raw *sugar* for food use must be free from filth, dirt and decomposition; the Food and Drug Administration knows of no process short of refining that assures freedom from such impurities.

175. *Salt* is a "food," whatever purpose may be intended for it; shipping for other purposes than food or feed should obviate diversion.

176. Label of blended *edible oils* should name specific oils present in descending order; percentage declaration desirable concerning presence of relatively small amount of one oil, such as "Flavored with —% olive oil"; a product containing but one ingredient is not entitled to exemption from declaring common or usual name.

177. Open containers for fresh fruits and vegetables should hold even multiples of one quart; such containers up to four quarts need not bear mandatory labeling.

178. Unless *vanilla* contributes at least 5 percent of the total flavor it should not be listed as a flavoring ingredient; wafers flavored with a mixture of *vanillin* and vanilla should be labeled "artificially flavored with vanillin."

SCHEDULE OF EVENTS

AUGUST

6—Association of American Importers of Green Olives, Hotel Pennsylvania, New York.
13–16—International Apple Association, Hotel William Penn, Pittsburgh.
21–24—National Food Distributors Association, Sherman Hotel, Chicago.
27–30—National Health Foods Association, Drake Hotel, Chicago.
29—American Cranberry Growers Association, semi-annual meeting, Pemberton, N. J.

SEPTEMBER

5–6—American Fisheries Society, Royal York Hotel, Toronto.
9–13—American Chemical Society, semi-annual meeting, Detroit.
22–25—Super Market Institute, Kansas City.
25 (approximate)—National Pickle Packers Association, fall meeting, Palmer House, Chicago.

Food Problems Involved In Cartel for Americas

Hemisphere defense in economic warfare by means of a great cartel covering all of the Americas was a grand idea. But Washington is beginning to doubt very much whether it will work. In fact, some Capital City observers claim that the purpose of the President's sudden announcement of this plan was merely to boost British morale and strengthen the ties which Uncle Sam wishes to have with Latin America. Certainly the recent events prove that the President did not have any factual matter before him when he made this gesture in early July.

Food problems are the ones which are most likely to cause difficulty in any effort to protect the bargaining power of this hemisphere. There is too great a similarity between North and South America in surpluses of food raw materials for comfort in planning. Everyone who recalls the effort of the Navy to buy Argentine canned beef will know that this question is full of political dynamite. Realists in Washington are, therefore, saying that only an European famine can make such cartel plan work for foodstuffs.

Far more imminent for the United States food manufacturers are the problems which may come from the Department of Agriculture's effort to create new raw material supplies in South America for use of American industry. One of the hottest of these proposals has been the plan for developing Brazilian tapioca to replace the starches now imported from the Far East. No one explains how this is going to coordinate with the Department of Agriculture's temporary effort in stimulating white potato starch manufacture in Maine and Idaho from surplus white potatoes and their other effort to create a sweet-potato starch industry in the lower Mississippi valley, from Mississippi to Texas.

More constructive effort is being made by other divisions than the merchandising groups. These other technical units seek to create new opportunity for food processing in the United States in order that a greater degree of national self-sufficiency may be established. Actual research in this direction is being planned aggressively by the Regional Laboratories of the Bureau of Agricultural Chemistry and Engineering.

Regional Labs to Open

The first of the four regional laboratories of the Bureau of Agricultural Chemistry and Engineering will be put into operation this month at Philadelphia. The northern laboratory at Peoria, Ill., probably will be opened shortly thereafter, with the other two, at New Orleans and San Francisco, following as soon as possible.

The Philadelphia laboratory is expected to begin research in apple juice at the outset. Lard studies also have been assigned to this laboratory. The laboratories will specialize in seeking industrial byproduct uses for food surpluses, but will also work on projects designed to develop new food processes.

Discovers Vitamin M

Protection of the animal body against the condition conducive to the reduction of red and white blood cells is a function of the new vitamin known as vitamin M. The discovery of this new vitamin was announced in a paper read by Dr. Paul L. Day of the University of Arkansas before the research section of the National Live Stock and Meat Board during its June 20-21 meeting in Chicago.

While liver is cited as the source of this vitamin, additional work is being done to determine the value of other meats as a source.

CAPITAL VIEWS

NEW EMPHASIS—Washington has difficulty in recalling the days when TNEC, a balanced budget and the Robinson-Patman Law seemed the most important activities of the Capital. Now, questions of defense, multi-billion spending and the what and when of taxes completely overshadow all these other "normal" efforts. Those who have favored the New Deal reform measures are, however, not inactive. Their activities are merely inaudible in the greater din of new and bigger government business.

THE "MAIN PANEL"—Food and Drug officials are emphasizing to industry that all of the legally prescribed information for food labels must be brought together on one panel of the container label. Sometimes an identification panel of the label merely pictures a gorgeous peach or gives some simple trade identification. Then the common or usual name of the goods, the net contents, the name and address of the manufacturer or distributor, and other required declarations make the secondary portion into the "main panel." The Department is quite insistent that this information be made sufficiently prominent that it will be influential in governing ultimate consumer transactions.

ILLEGAL TAX CLAIMS—When goods have been newly taxed it is often necessary to raise the price to cover this new cost. Then comes temptation. Those selling such goods, whether agents of manufacturers, wholesalers or retailers, are likely to tell the customer that the tax man is to blame for the price increase. Such a claim is illegal and subject to punishment by fine or imprisonment if the statement is not literally true. A price rise, no matter how necessary, which is only partly due to taxes must not be blamed on taxes. The Treasury is issuing warnings about this matter. Food executives may need to caution their sales forces and their customers on the same point.

AID FOR UNION WORKERS—An employer must not deny union organizers or other union workers freedom of access to the employees with whom they seek to work in the interest of collective bargaining. In some cases, companies have been directed to give the union representatives passes into works where employees are stationed, in order to facilitate unionization effort. The NLRB attitude in this matter seems extreme. But it is based on a legal requirement. That requirement is that the employer must not in any way interfere with those who seek to arrange for collective bargaining. It does not appear that food plant workers will ordinarily need to be consulted during their working hours in the employer's plant for union purposes. But the personnel management of such works must be very careful under present rulings that they do not place needless obstacles in the way of the union worker.

PURCHASE COORDINATION — The government buying of all kinds of goods is to be coordinated under Procurement Coordinator Donald M. Nelson. Incidentally, this gentleman is an experienced chemist and business executive, former director of purchases and executive vice-president of Sears Roebuck & Co. But this officer does not *do* the buying; he merely sees to it that the customary Army, Navy and civilian buying of all classes avoid conflict, escape duplication and carefully refrain from bidding one department against another for the same goods. Food manufacturers will continue to sell their products to Uncle Sam's agencies, both military and civilian, just as in the past. Those desiring to open up new markets with Army and Navy units will do well to get "National Defense Procurement," a bulletin of instruction issued by the Bureau of Foreign and Domestic Commerce, to guide them in this work.

EXPORT CONTROLS—The government has set up a long list of commodities which can be exported only after getting a license from the Division of Controls, State Department, Washington. Fortunately for the food industry, there are no commodities on that list as yet which are either foods or beverages or their food raw materials. It is likely to be much later before such restrictions on food export will be imposed, if such limitation is ever needed.

STANDARDIZATION—Some Washington planners are urging further standardization of consumer's goods and reduction in styles and lines. They argue that this will reduce manufacturing-plant burdens and release space for producing defense commodities. Those who argue that way look a bit like the customary consumer representatives dressed up in a patriotic defense costume.

DEFINING FILTH—Some of the specification and standards makers in Washington are shocked by the word "filth." That is an unfortunate word. And the thing which it represents in food is still more unfortunate. No one yet has devised a better word to describe in a standard or specification what must not be present. Both the AMS standards and the F&DA standards will continue to press on this idea no matter how unpleasant the word or the facts referred to may seem.

Army Will Experiment With Dehydrated Foods

Experiments in dehydrated foods as part of the Army diet will be expanded over the next few months, primarily to determine whether and how such foods could be fitted into any Army ration for field duty outside continental United States. Dehydrated products, in relatively small amounts, will be bought by the Army with limited funds outside the regular rations allowance and made available for use in field training work and for use on a semi-voluntary basis by various posts.

The Army has no plans to incorporate dehydrated foods into the regular garrison rations or into the normal field rations for training work in this country. Admittedly, however, in event of war outside the nation's boundaries, dehydrated foodstuffs would become a valuable part of the soldiers' rations, if the products meet dietary requirements, because of smaller bulk and weight.

To be usable by the Army for field work, dehydrated products must be packed in airtight and waterproof containers, and carton cases must be gasproof. If the package is not of tin, so much the better.

The principal question is whether dehydrated foods are robbed of their vitamins in processing. George M. Moffett, food section chief in the defense commission's procurement division, is seeking details of German processes which reportedly involve revitaminization, particularly with extra doses of vitamin B_1.

Lard Definition Delayed

All action on the Department of Agriculture's proposed definition for lard has been delayed at least into August, and probably later. Undersecretary Wickard extended until August 1 the deadline for filing briefs for or against the department's proposed definition. The likelihood still exists that another informal conference may be held before final decision is made.

Additional Funds Speed Stamp Plan Extension

The Government's blue stamp program to move food surpluses through retail market channels to relief families is going places. Original plans to have the program operating in 150 cities by the end of 1940 are being stepped up, keeping tempo with the $50,000,000 additional appropriation for moving surplus commodities which Congress tacked onto the first $185,000,000 fund for the 1941 fiscal year.

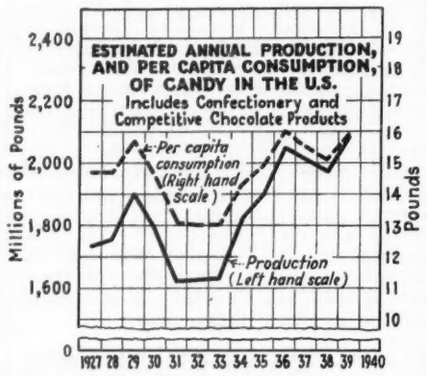
If half this extra money is allocated to the stamp plan—and more than half of the first fund has been—probably 200 cities will be on the list before 1941. This, however, is still only a fraction of the more than 1,100 communities which have asked for the stamps. Heavy demand is the best index to why the program is being accelerated.

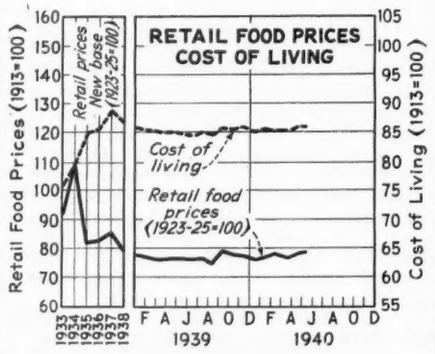
As of July 20, 129 areas had been designated for the stamps and in 90 of these they were on sale, with more than 1,500,000 persons participating—three-fourths of those eligible. Dollar expenditures were $13,369,000 to June 1, passed 17 million by July 1 and probably will top 21 million as of Aug. 1.

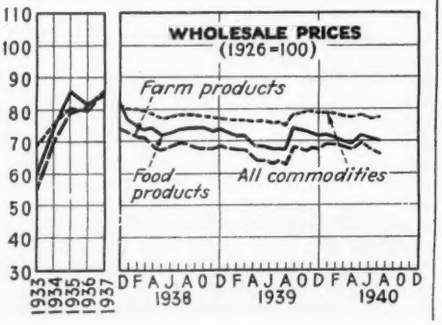
Since Dec. 15, 1939, when lard and pork products were listed as in surplus, roughly 30 percent of all blue stamps have been cashed for these commodities. Eggs and butter, on the list from the start, have consistently run between 17 and 25 percent each of all purchases. Fruits and vegetables, according to locality and season, take from 15 to 30 cents of every blue-stamp dollar.

Construction News

	Pending (thousands)	Awarded July (thousands)	Total Awarded 1940 (thousands)
Bakery	$40	$90	$1,797
Beverages	319	770	4,941
Canning and Preserving	.....	.....	163
Cold Storage Plants	200	40	545
Confectionery	.....	95	570
Grain Mill Products	140	.....	1,315
Ice Manufactured	.....	.....	151
Meats and Meat Products	305	80	1,370
Milk Products	210	80	1,079
Miscellaneous	510	490	3,876
	$1,724	$1,645	$15,807







Peanut Butter Standards Now Being Formulated

Both as a means of industry self-discipline and to protect the reputation of their product, members of Peanut Butter Manufacturers Association are undertaking the formulation of quality standards. This work is being done with the Agricultural Marketing Service through the office of Mr. Paul Williams, who is in charge of this type of commercial food standards.

The industry hopes that a new standard will eliminate two kinds of trade practice. In the one, an inferior grade of peanuts is employed, with resulting gritty and unpleasant product. In the other, lack of good housekeeping at the nut-crushing works results in other types of dirt and contamination. From either of these bad practices the reputation of the whole industry suffers. The methods of quality control being used by the industry, and proposed for the new standard, are those devised by the Food and Drug Administration.

Pollution Bill Stymied

Stream pollution would be prevented by any new manufacturing operations under a very drastic new law if the House of Representatives theory regarding the stream pollution bill were to prevail. The Senate differs on this principle and favors much more limited regulatory authority. The striking difference in policy of the two groups of legislators has kept the pending bill in conference where close Washington observers now expect that it will die. Those favoring constructive investigations by the Public Health Service without mandatory authority are not able to secure enactment of such a measure because of the more severe policies insisted on by the conferees of the House of Representatives.

Data for the Charts

In preparing the curves shown on this and the succeeding page of Food Industries, data were obtained from the following sources: Prices received by farmers, U. S. Department of Agriculture; employment, payrolls, wholesale and retail prices, U. S. Department of Labor; cost of living, National Industrial Conference Board; commodity price index, *N. Y. Journal of Commerce;* business activity index, *Business Week;* data for candy production and consumption are from the U. S. Department of Commerce.

Food Commodities Rise

While the general level of commodity prices in mid-July showed no change from mid-June, food commodity prices showed some increase. In contrast, grain prices slacked off. Commodity price index numbers of the *N. Y. Journal of Commerce* show the general index at 78.8 on June 15 and again on July 13. The index for grains, at 65.1 on the earlier date, fell to 60.5, while the index for foods rose from 65.3 to 67.6 in the four week period.

Spot prices for individual food commodities also showed considerable change in the four weeks from June 15 to July 13. Wheat, No. 2 dark winter, fell from 77c. to 66¾c. Flour was off from $4.85 to $4.50 per barrel. Corn, No. 3 yellow, fell from 64½c. to 63½c. In contrast, beef increased from 15½c. to 16½c., while pork loins advanced from 12c. and 17c. Lard also advanced slightly, from $6.25 to $6.30. Eggs were up ½c., while butter was unchanged and cheese rose from 15c. to 15¾c. Among the import commodities, sugar was off from $2.77 to $2.70, coffee decreased from 7⅛c. to 6⅞c. and cocoa rose from $4.81 to $4.85. Little change occurred in canned foods, except for salmon, which increased from $2.25 to $2.30.

Meat Consumption Higher

According to R. C. Pollock, of the National Livestock and Meat Board, as reported in the *Chicago Journal of Commerce,* U.S. meat consumption in 1939 was at an all-time high of 17,201,000,000 lb. Also, consumption in the first four months of this year was reported to be 17 percent greater than in the same period of last year. The same report pointed out that the meat animal population of the country increased by 11,000,000 head in 1939.

Ample Crops Reported

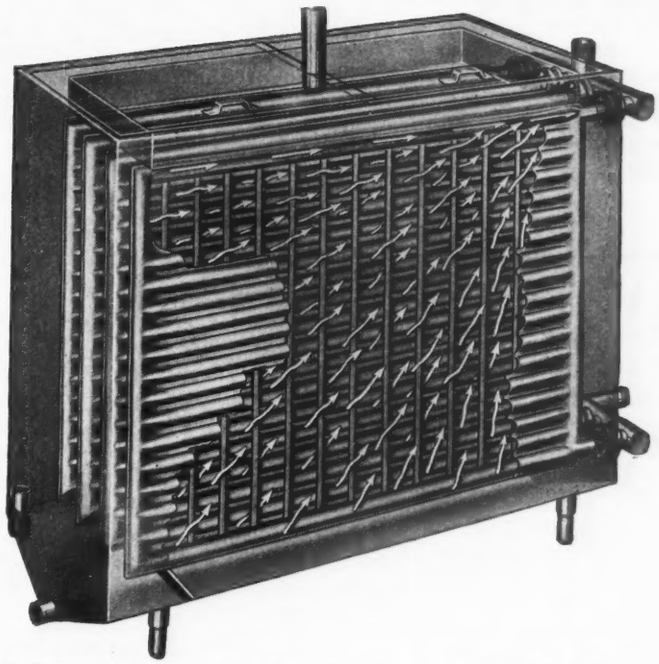
In spite of reductions in expected output of some important crops such as wheat and rye, 1940 promises to see ample supplies of all domestic food raw materials, according to the July report of the Crop Reporting Board.

Corn production of 2,415,988,000 bu. is expected, 5 percent over the 1928–1937 average. Wheat output is placed at 728,644,000 bu., compared to a 1928–1937 average of 754,685,000 bu. Larger than average yields of soybeans, potatoes, rice, beans, barley and oats are in prospect.

Commercial vegetable crops are expected to be about 13 percent greater than in 1939, with crops for canning up about 20 percent over that year and 11 percent over the 1928–1937 average.

Fruit and nut crops in general are forecast as larger than average, with large crops of pears, plums and citrus fruits offsetting decreases in apples, peaches, grapes, prunes and apricots.

32° Water Flows Off This Unit



Cutaway view showing placement of cooling sections in tank. Arrows indicate short refrigerant gas flow.

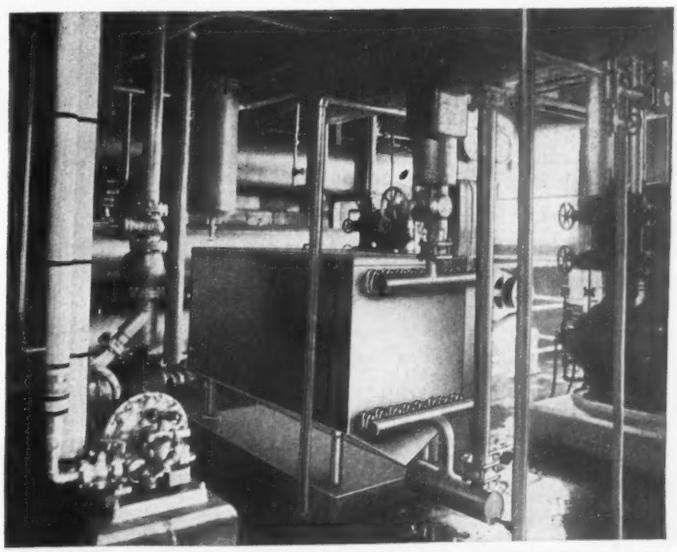
HERE'S a unit that not only cools water to 32° in a split-second with no danger of the cooling sections freezing up—but maintains the 32° temperature *constantly!*

You get this unusual performance with a Jensen Chilled Water Unit because of its patented "short gas flow" principle which permits the *swift* escape of refrigerant gas . . . enables you to use higher-temperature refrigerants . . . and lightens the load on the compressor. *It's ideal to use when your compressor is under-capacity!*

Jensen Chilled Water Units may be operated on the recirculating principle, or on a "once-over" basis. They can be built to handle 300 tons down to a fraction of a ton, and any storage capacity you wish can be provided.

Save money by cooling the "Jensen way." Write for bulletin 48. **Jensen Machinery Company, Inc., Bloomfield, N. J.; Chicago, Ill.; Oakland, Calif.**

JENSEN



Jensen Recirculating Chilled Water Unit installed in Gordon Baking Company's Salamanca, N. Y., plant. Unit contains eight cooling sections handling up to 62.5 tons of refrigeration per hour.

JENSEN CHILLED WATER UNITS

Hog Cycle Past Peak

In its recent pig crop report, the U.S. Department of Agriculture states that hog production is now declining, having reached the peak of the current cycle in 1939. It is estimated that the spring pig crop this year was 8 percent smaller than in 1939. And the fall pig crop this year is expected to be about 12 percent below last year's crop. In spite of this decrease, averaging 10 percent for the year, the 1940 pig crop will still be about 7 percent above the 1929–1938 ten-year average.

Although the cycle is declining, hog numbers are still at peak. Consequently, pork production is high and June, 1940, recorded the largest June output of pork since 1933.

INDICATORS

CONFECTIONERY and competitive chocolate products sales in May, 1940, as reported by the U.S. Department of Commerce for 231 identical firms, totaled $17,723,000 compared to $16,046,000 in May, 1939, and to $18,009,000 in April, 1940.

SUGAR EXPORTS of the United States for the first five months of 1940 are reported by Lamborn & Co. at 80,368 long tons, the highest figure in 15 years, and comparing to 33,065 tons in the corresponding period of 1935.

FLOUR PRODUCTION in June, 1940, as reported by *The Northwestern Miller* for mills representing 64 percent of total U.S. production, was 5,036,806 bbl., compared to 5,611,846 bbl. in June, 1939.

FLOUR PRODUCTION for the year ending June 30, 1940, as reported by *The Northwestern Miller* for mills representing 64 percent of total U.S. production, was 68,293,157 bbl., compared to a production of 69,028,188 bbl. in the preceding year.

PEA PRODUCTION for canning and freezing in 1940 is now expected to total 293,160 tons, compared to a ten-year average of 204,140 tons and to the record production of 302,540 tons in 1938.

SNAP BEAN PLANTINGS for canning and freezing are now reported to total 57,590 acres, compared to 54,860 acres in 1939 and to a 1930–1938 average of 57,380 acres.

TRUCK CROPS are expected to show increases this year, according to the Bureau of Agricultural Economics, with larger outputs of beets, cabbage, carrots, lettuce, green peas, tomatoes and watermelons.

SWEET CORN ACREAGE for canning in 1940 is now put at 312,518 acres by the National Canners Association, which compares to 236,219 acres in 1939.

TOMATO ACREAGE for manufacture in 1940 is now estimated at 391,630 acres, compared to 371,730 acres planted in 1939.

BEET ACREAGE for canning in 1940 is expected to total 12,200 acres, compared to the 9,060 acres that was planted last year.

GREEN LIMA BEAN ACREAGE for canning and freezing in 1940 is now placed at 50,670 acres, compared to 50,540 acres planted in 1939.

BUTTER, creamery, produced in May, 1940, was reported by the Agricultural Marketing Service at 188,645,000 lb., 2 percent below production in May, 1939, but 2 percent over the May, 1930–1938 average.

CHEESE, American, produced in May, 1940, totaled 67,780,000 lb., according to the Agricultural Marketing Service, an increase of 10 percent over production in May, 1939.

OLEOMARGARINE SALES in May, 1940, as indicated by sales of internal revenue stamps, were 26,387,334 lb., compared to 22,938,328 lb. sold in May, 1939.

EGG PRODUCTION in May, 1940, was 5 percent above May, 1939, and 7 percent over the 5-year average for the date.

FRUITS, frozen, in storage on July 1, 1940, totaled 120,353,000 lb., compared to 104,110,000 lb. on July 1, 1939, and a 1935–1939 average for July 1 of 88,785,000 lb.

VEGETABLES, frozen, in storage on July 1 of this year were 52,641,000 lb., compared to 54,141,000 lb. a year before.

BUTTER, creamery, in storage on July 1, 1940, was 80,842,000 lb., compared to 131,609,000 lb. a year previous, and to an average of 101,281,000 lb. for the same date in 1935–1939.

CHEESE, all kinds, in storage on July 1 of this year was 114,475,000 lb. A year before the figure was 98,850,000 lb. and the 1935–1939 average for July 1 was 96,008,000 lb.

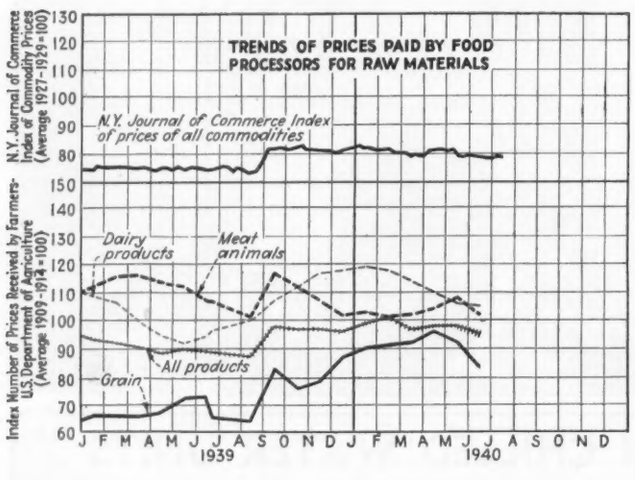
EGGS, case equivalent, in cold storage on July 1, 1940, amounted to 11,901,000 cases, compared to 11,019,000 cases on July 1, 1939, and to an average of 11,084,000 cases for the date in 1935–1939.

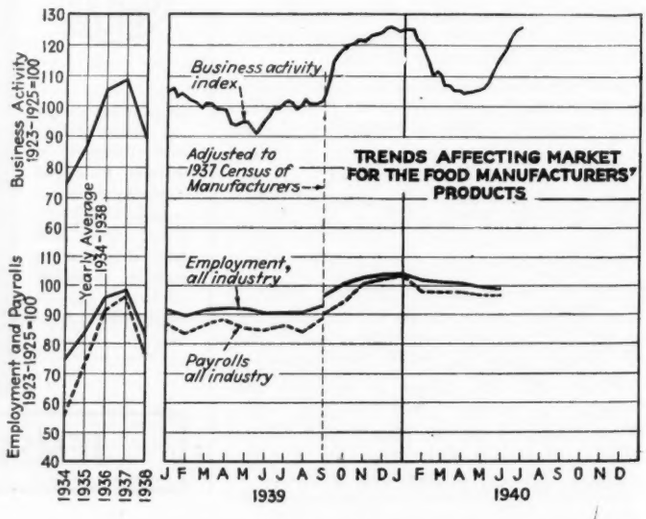
POULTRY, frozen, all kinds, in storage on July 1 of this year was 82,389,000 lb. A year before the amount was 67,470,000 lb. and the average on July 1 in 1935–1939 was 57,635,000 lb.

MEAT, all kinds, in cure and frozen storage on July 1, 1940, totaled 725,876,000 lb., compared to 600,676,000 lb. on July 1, 1939, and to an average for July 1 of 583,991,000 lb. in the years 1935–1939.

LARD in storage on July 1 of this year was 305,714,000 lb. The quantity a year ago was 148,377,000 lb. and the 1935–1939 average for the date was 130,204,000 lb.

WEEKLY INDEX of wholesale food prices of Dun & Bradstreet stood at $2.24 on July 11, compared to $2.16 for the corresponding week of 1939.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of Commodity Prices (Average 1927-1929=100)
N.Y. Journal of Commerce Index of prices of all commodities
Index Number of Prices Received by Farmers-U.S. Department of Agriculture (Average 1909-1914=100)
Dairy products
Meat animals
All products
Grain
J F M A M J J A S O N D J F M A M J J A S O N D
1939
1940


Business Activity 1923-1925=100
Yearly Average 1934-1938
Employment and Payrolls 1923-1925=100
1934
1935
1936
1937
1938
Business activity index
Adjusted to 1937 Census of Manufacturers
TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Employment, all industry
Payrolls all industry
J F M A M J J A S O N D J F M A M J J A S O N D
1939
1940

Consumers' Union Takes an Ally

(Continued from page 33)

in the consumer movement to: (1) Protect consumers from increased prices, or lowered quality; (2) raise the standard of living of the "lower half." The second was advocated not only as a necessary defense move but also as an essential for the preservation of our present form of government.

It is not improbable that the whole consumer movement *is* entering the "second stage" where name-calling and belligerent attacks are replaced to some degree by recognition of some of the merits of the "opposition" and also by the extending of "feelers" from both sides toward reconciliation, adjustment and cooperation.

Invisible Light Shows Defects

(Continued from page 53)

other seeds can also be determined by the fluorescence colors.

Solvent-extracted olive oils generally show a violet fluorescence, whereas pressed oils have a yellow or characteristic fluorescence under the lamp. The rays also give good indications of heat treatment and deterioration due to light. According to some authorities, as little as 1 percent of refined olive oil in virgin oil may be detected by the change of fluorescence color of the latter; 10 percent of soybean oil, bean, corn and grape seed oils added to virgin olive oil also alter the fluorescence.

Butter, margarine, lard, mutton and horse fats are readily differentiated, and 15 percent of margarine is detectable in admixture with butter under the lamp. Five percent of foreign fats admixed with butter can be detected if pure butter is used as a comparison. Age, rancidity, pretreatment and admixture with foreign fats are detectable. And where addition of vegetable fats or horse fat gives no difference in refractive index, ultraviolet light will distinguish additions of as little as 10 percent.

Thorough tests have been made on lard by several workers. Highly refined pure pork lard is fluorescent, but a mixture of hog and horse fats is not. A peculiar and characteristic fluorescence is given by unrefined horse fat and fats containing it; the presence of even less than 0.001 percent can be ascertained with certainty. The various treatments to which lard may be subjected all cause alteration in the fluorescence, and addition of 10 percent of cottonseed, sesame and arachis oils all give striking changes in the fluorescence color.

The blue fluorescence of margarine is depressed by the addition of certain pigments, and addition of the unsaponifiable matter from cod-liver oil markedly increases the brightness and, at the same time, decreases the blue color of the fluorescence. Addition of certain vegetable oils which fluoresce with a bright blue color, or of oleo, which has a greenish fluorescence, will also modify the fluorescence of margarine in a similar way.

A solution of cocoa butter in petroleum spirit examined under the lamp will give strong indications of its purity; 1 percent of cocoa extract or waste butter gives a brilliant fluorescence. If the solution shows no fluorescence, then the butter is certainly not solvent extracted, whereas a strong fluorescence shows solvent extracted butter or contamination with mineral oil.

The ripening of cheese can be followed by using the lamp, the yellow fluorescence of new cheese going to blue as the ripening progresses. Living fungi show a brilliant green fluorescence which is absent in dead fungi, and therefore the method is of value for the examination of Gorgonzola and Roquefort cheese.

The decomposition of fish shows clearly under the lamp about 24 hours before it is detectable by any other means, and this offers the possibility of being able to assess the keeping quality of fish.

With cocoa, the presence of 1 percent of husk may be detected in the rays from the lamp. And the detection of chicory in coffee and the differentiation of white from black pepper are much simplier and more rapid under the lamp than when the microscopical examination is carried out using gas or daylight for illumination.

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Men, Jobs & Companies

INDUSTRY

Amalgamated Sugar Co., Ogden, Utah, will spend $600,000 to construct a modern sugar warehouse.

Centennial Flouring Mills Co., Seattle, Wash., has opened new flour mills in Spokane which are said to be the most advanced flour mills ever built.

Coca-Cola Bottling Co. will build a $60,000 plant at Covington, Tenn. Tentative plans call for a separation of the bottling room from the lobby by a large plate glass window through which visitors can watch bottling operations.

Coca-Cola Co. will build a one- and two-story plant and warehouse, with basement, 110x132 ft., at St. Paul, Minn., to cost about $150,000 with equipment.

Deerfield Packing Co., Ltd., Montreal, has been awarded the contract to pack Birds Eye frosted foods for Hudson's Bay Co., Winnipeg, recently appointed exclusive Canadian distributor for this product.

Fer-Mi-Lac Process Co., St. Louis, a patent-holding concern which originated a processed buttermilk 20 years ago, is facing a suit for dissolution in the Circuit Court.

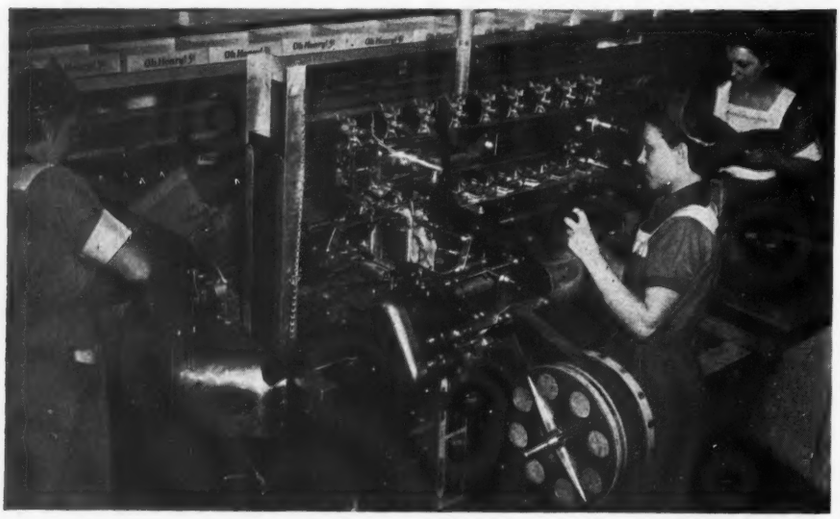
Frozen Products Corp. will build a quick-freezing plant at Knoxville, Tenn. W. E. Booker is president and manager.

Hecker Products Corp., New York, has formed a flour and cereal division which will handle the sale and merchandising of its family baking flours and cereals which were formerly handled separately by the manufacturing subsidiaries. The new division will be headed by Duncan C. Menzies as general manager.

H. J. Heinz Co.'s nutritional research division in Mellon Institute, Pittsburgh, is publishing a new quarterly journal, *Nutritional Observatory.*

Helwig & Leitch, Inc., Baltimore, in addition to building a brining station at Port Royal, Va., is also increasing its Baltimore plant tankage to a capacity of 30,000 bu. of brine pickles. Ten salting stations have been taken over in Wisconsin.

Imperial Ice Cream Co. will build a $65,000 plant at Bluefield, Va. The plant will be a one-story brick structure, 100x135 ft.



CUTS WRAPPER COSTS 35 PERCENT

One of the 14 electronically controlled wrapping machines which Williamson Candy Co. has installed at its Chicago plant. Production has been increased and paper costs cut 35 percent by these machines. Each machine wraps 80 to 110 "Oh Henry" bars a minute. A photo-cell scanner actuates a mechanism which controls the rate at which the wrapper is fed so as to keep it in proper register with the cutter. The electronic regulators are Westinghouse units.

Harris & Ewing

DR. G. E. HILBERT

He will head the starch and dextrose division of the Northern Regional Research Laboratory which is being constructed at Peoria, Ill. Dr. Hilbert has been connected with the regional laboratories since 1938 as scientific adviser. He joined the Bureau of Chemistry and Soils in 1930.

Italian Swiss Colony, Asti, Calif., has acquired the 1,250,000-gal. La Paloma Winery at Tarpey. Present plans are to increase this winery, also known as California Wineries & Distilleries, Inc., to 3,000,000 gal.

Jones Pie Baking Co. will construct a one-story plant of limestone, brick and structural steel, at Hillside, N. J., at a cost of $90,000. Equipment will include four 18-ft. rotary ovens.

Mutual Citrus Products Co. has filed a triple-damage suit in Federal Court against General Foods Sales Corp. for alleged discrimination in violation of the Robinson-Patman Act. The complaint charges that General Foods gave dealers one dozen packages of its "Sure-Jell" free with the purchase of two dozen, and that this special deal was advertised and given only in areas where Mutual Citrus Products Co. was operating as the main competitor.

North Carolina State College has opened a new $98,000 dairy plant at Raleigh which was constructed with PWA funds.

Pillsbury Flour Mills Co., Minneapolis, has purchased all properties, assets and business of Globe Grain & Milling

Steel—FIRST LINE OF NATIONAL DEFENSE

Steel is essentially a peacetime industry—and America's normal appetite for steel is great.

This is fortunate for all of us.

It permits steel producers to carry on year after year and to find employment for hundreds of thousands of men.

It makes management extend itself to remain competitive—to improve its production facilities—to better the quality of its old products—through research, to devise new products—in order to win in the battle for markets that goes on apace in all industry.

Republic has done exactly that and—in the emergency now facing America—is in a position to supply more and better steel—the first line of any nation's defense.

Republic has invested millions of dollars in plants, in equipment, in research and in the training of men. Republic has expanded its ore supplies—enlarged its blast furnaces—increased open hearth and electric furnace capacity—built new mills and added new finishing equipment. But more, Republic has built an organization of men who know steel.

And now, seeing but dimly through the haze that clouds all business prophecy, but realizing our own deep responsibility, Republic, vital to peacetime prosperity, pledges its every effort to help keep America the way we know it and love it—to keep America safe for Americans—through steel, first line of national defense.

Republic Steel Corporation, Cleveland, O.

T. M. Girdler
CHAIRMAN OF THE BOARD

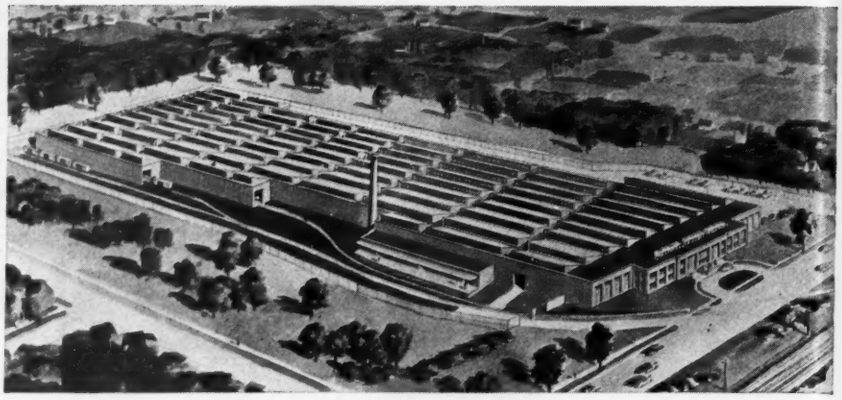
J. A. Tyson
PRESIDENT

Co., Los Angeles, and will operate it as a separate division of the company. The Globe company operates mills at Los Angeles, San Francisco, Sacramento, and Ogden, Utah.

Refining, Inc., Long Island City, N. Y., will construct a pilot plant at Charlotte, N. C., for its vegetable oil processes.

Jacob Ruppert Brewery, New York, has contracted for a new fleet of 200 specially designed Mack trucks, representing a transaction of around $500,000.

Swift & Co., Chicago, will build a one-story plant, 150x340 ft., at Seattle, Wash., to cost about $160,000. The plant will be the headquarters for the Alaska trade as well as serving the Seattle area. The branch is under the management of W. G. Young.



DAYLIGHT BAKERY WITHOUT WINDOWS

This $3,200,000 biscuit bakery has recently been constructed by National Biscuit Co. at Atlanta, Ga., and will be placed in operation by the end of the year. The side walls are nearly windowless, but strong natural lighting is obtained by means of a windowed, saw-tooth roof. All manufacturing operations will be on one floor, with straight-line production, and will represent an advance in cracker baking practice.

PERSONNEL

Edward Applegate has resigned as chief engineer of Oscar Mayer & Co., Chicago, to become assistant chief electrical engineer of Crane Co.

Sidney Craig, part owner of Fall Creek Canning Co., Pendleton, Ind., has bought the Carroon Packing Corp. at Fowler, Ind. He plans to build a new two-story factory of glazed tile.

Robert J. Douglas has been named president of the newly formed Cheese Producers Marketing Association, Monroe, Wis.

Lon P. Flanigan, of Geneva, N. Y., has been reelected president of National Kraut Packers' Association.

Dr. B. W. Hammer, professor of dairy industry at Iowa State College, and Dr. C. W. Turner, professor of dairy husbandry at the University of Missouri, were presented with the Borden award for outstanding research in dairy science at the annual meeting of the American Dairy Science Association. Dr. Hammer has made recent contributions to improvements in the flavor and quality of cheese and butter. Dr. Turner was nominated for his studies in milk production.

C. Hays Hollar has purchased the interests of the other stockholders of Newbern (Tenn.) Canning Co. and will operate the plant under his own name. Improvements in the property will be made and additional machinery installed.

R. Arnold Jackson has resigned as head of the bread department of National Biscuit Co., New York.

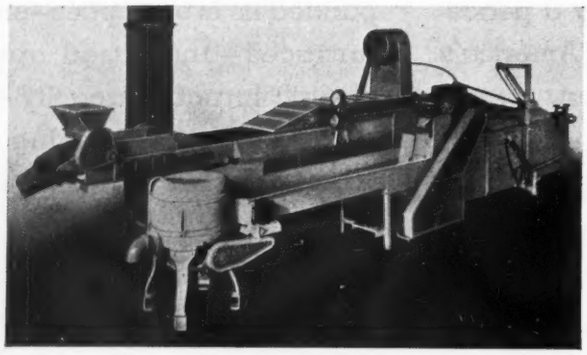
William S. Kelley, Jr., plant manager for Campbell Soup Co., Ltd., New Toronto, has been made a director of the company. He succeeds the late Raymond B. Nieukirk.

Walter S. Mack, Jr., president of Pepsi-Cola Co., Long Island City, N. Y., has established the Walter Mack Job Awards for American Youth, which provides a kind of business internship for young college people. Jobs are created for the winners, who are then employed for a year at a salary of $1,300.

Baury Robinson has been elected president of Gregory-Robinson-Speas, Inc., Paris, Tex., to succeed the late O. L. Gregory.

Dr. Henry Clapp Sherman, professor of chemistry at Columbia University, has received the Borden award for outstanding research in nutrition from the American Home Economics Association. Dr. Sherman was cited for the additions that he has made in the knowledge of milk as a food in the diet.

That's all there is to it!



Anyone with two hands and an eye is physically equipped to operate the machine that turns a single room into a complete and highly profitable factory . . . It's the unique

FERRY CONTINUOUS POTATO CHIP MACHINE

Loading the peeler and inspecting the slices can easily be done by one man on a Ferry Machine that produces the finest chips you ever tasted. All are uniform in color, texture and saltiness. All are "extra fancy" grade, hour after hour; day in and day out. No rancid or soggy chips — no complaints. And the profits to be made by the Ferry method will put your competitors in the red . . . A fully illustrated catalog showing sizes, types, method of operating will be sent you by return mail. Write us today.

J. D. FERRY CO. 129 So. Cameron Street HARRISBURG, PA.

J. R. Stephenson has been appointed Chicago branch manager for Burry Biscuit Corp., Linden, N. J.

C. L. Taylor, formerly assistant sales manager in charge of promotion at Wander Co., Chicago, has become general manager of Verifine Dairy Products Corp. at Milwaukee.

Clarence M. Walters has been named manager of the purchasing department of Libby, McNeill & Libby, Chicago.

DEATHS

J. L. Bayless, 61, part owner of Jefferson Island Salt Co., Louisville, Ky., recently.

Henry A. Gunther, 62, vice-president of F. W. Gunther Co., Racine, Wis., June 24, at Rochester, Minn.

George B. Harris, 79, one of four partners in Wisconsin Butter & Cheese Co., July 3, at Waukesha, Wis.

Gilbert Johnson Hurty, 62, president of Hurty-Peck & Co., Indianapolis, recently.

C. W. Partridge, secretary of the Association of Operative Millers, recently, at Kansas City.

Gardner Poole, 63, vice-president of Forsted Foods Corp., New York, July 6, at Boston. He was formerly president of Commonwealth Ice & Cold Storage Co. of Boston and a past president of United States Fisheries Association and of American Society of Refrigerating Engineers. He was known as an authority on refrigeration.

ASSOCIATED INDUSTRIES

Baker Ice Machine Co., Inc., Omaha, reports the death of its founder, Joseph L. Baker, June 27. He was also a founder of United States Gypsum Co., Chicago.

L. A. Baumann & Associates has been formed at Washington, D. C., as a consultant to the dairy industry.

Commercial Solvents Corp., Peoria, Ill., is now putting out a Riboflavin concentrate (Vitamin G) for food manufacturers.

Continental Can Co., Inc., New York, will build a can-manufacturing plant at Walla Walla, Wash.

Federal Motor Truck Co., Detroit, has elected T. R. Lippard, president and general manager. He was also made a director.

Girdler Corp., Louisville, Ky., has announced that Standard Milk Machinery Co. and Emil H. Pferrer Co. have become affiliated with its concern.

These "EXTRAS" Cost You Nothing... *AND MAY SAVE YOU MONEY*

COMPLETE SERVICE

PERIODIC INSPECTIONS

LIABILITY INSURANCE

ALL SAFETY PRECAUTIONS

MOST EFFICIENT METHOD

BETTER RESULTS

From an Industrial Fumigation Engineer—located near you.

WHEN you turn the problems of pest control in your plant over to an Industrial Fumigation Engineer—you can forget them!

He will assume complete charge—taking full responsibility for the job. He is qualified by training and experience in this specialized field. He knows insects, their habits, life-cycle, and how to control them at all stages and under all conditions.

As a part of his service he supplies all materials; recommends the type and frequency of fumigation necessary for best results in your plant and sees the job through. He carefully guards the safety of your employees and your merchandise. His own workmen are schooled in their job. For your protection he carries Fumigation Liability Insurance.

The services of the Industrial Fumigation Engineers are nation-wide—one of these specialists is located near you. We will be glad to ask him to make a survey of your requirements and submit his findings for your study and consideration. This involves no expenditure of money on your part. Write to us today for full information.

THE FUMIGANT OF CHOICE

LIQUID HCN continues to be the fumigant of choice with the Industrial Fumigation Engineer. Its remarkable killing power, cleanliness in use, and low cost enables him to get the results that the flour miller and the food manufacturer want — complete insect control at low cost. Let us explain the advantages to you of LIQUID HCN fumigation, and write to us for the name of the Industrial Fumigation Engineer located nearest to you. He will be glad to make a survey of your plant at no cost to you.

American Cyanamid & Chemical Corporation

INSECTICIDE DEPARTMENT

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

KANSAS CITY, MO. • AZUSA, CALIF.

Just off the Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

CLEANING OPERATIONS — "Bakery Performance Reports" is a series of reports on pan cleaners, general cleaners, oven and truck maintenance issued by Magnus Chemical Co., Garwood, N. J.

DRYING EQUIPMENT—Vacuum rotary dryers for fast drying at low temperatures and recovery of solvents are described and illustrated, with application information, in 24-page Bulletin No. 324, Buffalo Foundry & Machine Co., Buffalo, N. Y.

MATERIALS HANDLING EQUIPMENT —Overhead conveying equipment of the trolley and chain trolley type, also gravity roller conveyors and belt conveyor idlers, are described with specifications in general catalog No. 140 issued by Saginaw Stamping & Tool Co., Saginaw, Mich.

MEAT PACKING EQUIPMENT—Machinery and equipment for lard making, sausage manufacture, meat loaf pan filling and hog dehairing are among the items described in new leaflets issued by Cincinnati Butchers Supply Co., 1972 Central Ave., Cincinnati, Ohio.

MILK DRYERS—Double drum driers for the production of dry milk products are described and illustrated with specifications in 12-page Bulletin No. 299, published by the Buffalo Foundry & Machine Co., 1635 Fillmore Ave., Buffalo, N. Y.

Plant Accessories and Supplies

ALLOY METALS—"Seven Minutes with Seven Metals" is a 16-page pocket-size publication discussing nickel and nickel alloys, published by The International Nickel Co., 67 Wall St., New York, N. Y.

BOILER AND TANK ACCESSORIES—A complete catalog on its line of accessories for fired and unfired pressure vessels, including covers, fittings, flanges, gaskets, and so on, has been issued by the Steel Improvement & Forge Co., Cleveland, Ohio.

CAPACITORS—Type FP, dust-tight capacitors for industrial plant use are described in 10-page Bulletin 49-120 by Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

COLORS AND FLAVORS—Food colors, flavors and essential oils are listed with prices in a recent wholesale price list of Fritsche Bros., Inc., 76 Ninth Ave., New York, N. Y.

ELECTRIC MOTORS — Fractional horsepower motors, a.c. and d.c., in sizes from one-twentieth to ¾ hp., for use on small industrial machines, are described in Bulletin F-8548, issued by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

FLAVORS AND ESSENTIAL OILS— New wholesale price list of essential oils, vanilla, flavor bases and other chemical products has been issued by Dodge & Olcott Co., 180 Varick St., New York, N. Y.

GENERATORS—Applications of diesel-electric generators for industrial purposes are described and illustrated in Forms 6188 and 6189, issue by Caterpillar Tractor Co., Peoria, Ill.

ICE-MAKING MACHINE—"Pak-Icer," a machine said to produce ice for dairy, meat processing and other food plants at a lower cost than that produced by any other method, is described and illustrated in 16-page illustrated Bulletin No. 1237 issued by the Vilter Mfg. Co., Milwaukee, Wis.

MAINTENANCE MATERIALS—Paints, cleaners, waxes, rust-proofing and other maintenance materials are described in Catalog No. 8 issued by the Skybrite Co., 3125 Perkins Ave., Cleveland, Ohio.

ROTARY PUMPS—A full line of rotary pumps, particularly designed for use in handling food liquids and similar products, in capacities up to 450 g.p.m., is described in Bulletin No. 5135, by Fairbanks, Morse & Co., Chicago, Ill.

SAFETY SHOES—The 1940 issue of "Safety Shoe Buyer's Guide", describing more than 60 different styles of safety footwear for use in the industrial plant, has been issued by Lehigh Safety Shoe Co., Allentown, Pa.

VALVES AND FITTINGS—Catalog No. 3 describing a line of cocks, hose couplings, elbows, fittings, swing joints, plugs, swing unions, and other valves and fittings, has been issued by Pittsburgh Brass Mfg. Co., 3218 Penn Ave., Pittsburgh, Pa.

VOLTAGE REGULATOR—The "Airs" regulator for holding correct voltage, in sizes from 1.2 to 12 kva., from 120 to 600 volts, is discussed in Bulletin GES-2285 of General Electric Co., Schenectady, N. Y.

Control Equipment

CONTROL EQUIPMENT—Remote control switches, automatic time switches, automatic reset timers, process timers and program clocks are among the types of automatic control equipment discussed in a recent bulletin of Zenith Electric Co., 607 S. Dearborn St., Chicago, Ill.

CONTROL INSTRUMENTS — "Thermotrol", a combination of recording or indicating thermometer with a "Flameotrol", for controlling temperature and protecting against explosion hazards, is discussed with other Wheelco instruments in Bulletin No. G2000-4, issued by Wheelco Instruments Co., 1929 S. Halsted St., Chicago, Ill.

THERMOMETERS — Industrial glass stem thermometers are described in Bulletin No. 524 of The Bristol Co., Waterbury, Conn.

VACUUM GAGE—Portable vacuum gages for use with high-vacuum installations are described in Bulletin No. 40-G issued by F. J. Stokes Machine Co., Tabor Road, Philadelphia, Pa.

Our Standards—
YOUR REQUIREMENTS

THE ideal delivery equipment for you is the equipment that comes nearest your exact requirements. We know that. We build trucks for you, not for ourselves.

But we reserve the privilege of satisfying our own standards with respect to quality. Quality, in a Ford unit, means many things. Long-lasting, special alloy steels. Advanced engineering for better performance, tighter control of running costs. Good body design, with emphasis on smart appearance and an eye toward ease of working the load. Sound body construction for load protection.

Try a Ford on your job. Ask your dealer about a free "on-the-job" test with your own driver at the wheel. He'll have some good things to say about easy handling, quietness and comfort. And *you'll* be pleased when you see how little a Ford costs to own and operate.

•

VISIT THE NEW FORD EXPOSITIONS AT THE TWO FAIRS, NEW YORK AND SAN FRANCISCO, 1940

Dual tires, dual rear fenders and running boards, as illustrated, available at small extra cost.

FORD TRUCKS
AND COMMERCIAL CARS

FORD MOTOR COMPANY, BUILDERS OF FORD V-8 AND MERCURY CARS, FORD TRUCKS, COMMERCIAL CARS, STATION WAGONS AND TRANSIT BUSES.

Food Equipment News

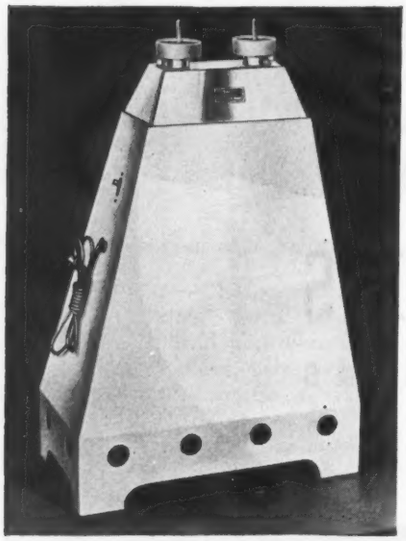
REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Container Cleaner

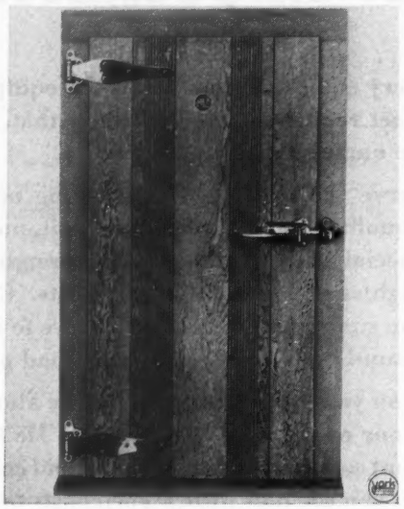
U. S. BOTTLERS MACHINERY CO., 4015 N. Rockwell St., Chicago, Ill., has brought out the Model "EG," two-tube air cleaner for blowing out dirt, dust and other foreign material from containers or bottles before filling. Having two air nozzles, the operator can clean two containers simultaneously. Cleaning operations are automatic, with containers placed on the cleaning tubes and removed by hand. The standard machine is suitable for containers with neck openings up to 4 in. When containers are in excess of this diameter, a special type of cup is necessary which can be furnished if desired.

The machine is supplied with compressed air for cleaning purposes, by means of a motor-driven compressor located within the base. Reference to the accompanying photograph will show the two air nozzles at the top of the machine. Beneath each is the rubber container holding cup. Underneath that is an aluminum housing which protects the cleaning mechanism and contains a dust-collecting chamber.

This machine is mounted on casters for portability and requires a floor space of 27 x 14 in. Operation is by means of a 1½ hp. electric motor connected by V-belt to the compressor.



Air cleaner for containers



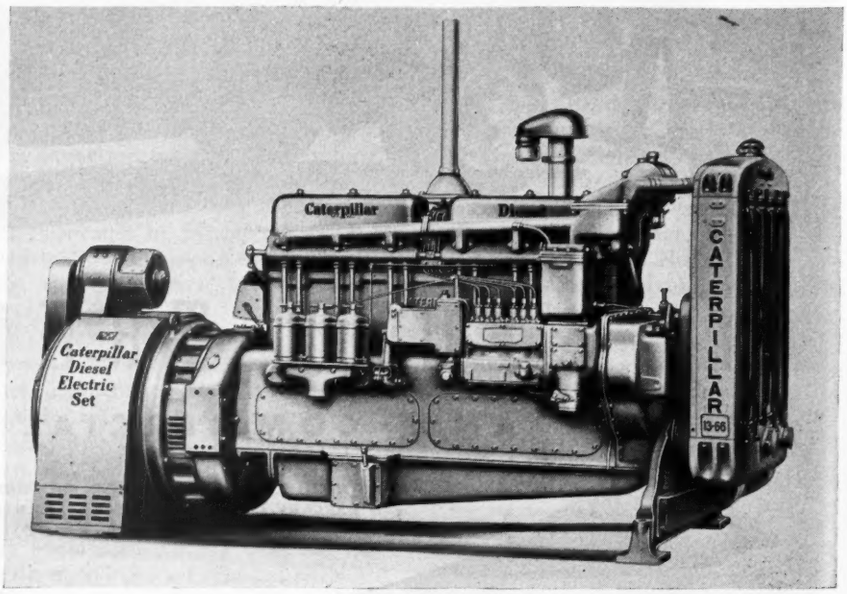
"Roller-seal" door for cold storage room.

Cold Storage Door

YORK ICE MACHINERY CORP., York, Pa., has introduced a new line of cold storage doors, called the "Roller-Seal". The feature of this door is a new method of sealing. With this method, the inner gasket is attached to the edge of the door instead of to the frame. It seals by a combined rolling and wedging action between the edge of the door and the frame. The manufacturer claims for this design that it avoids trouble from freezing, pitting and damage to the inner seal, thus providing a double-seal refrigerator door which is easier to operate and causes less maintenance. In addition for this seal the manufacturer claims that the inner seal is tighter, that there is freedom from gasket damage by passage through the doorway, that there is a reduction of 61 percent of projections in the doorway, and a reduction of 4 in. in the radius of swing. The new doors are made of Douglas fir and are styled with a vertical ribbing, which is said to give added strength to the front members and added rigidity to the construction. This construction is also said to aid in preventing the accumulation of moisture and dirt.

Electric Generating Set

TWO NEW SIZES, of larger capacity, have been added to the line of self-contained diesel-electric sets made by Caterpillar Tractor Co., Peoria, Ill. These new sets are a 66-kw. and a 52-kw. unit. They are completely self-contained and require no other



Diesel-electric set of 52 or 66 kw. capacity

If you package frozen foods
LOOK OUT
FOR WRAPPER TROUBLE

Let's get this straight about packaging frozen foods. It's no job for ordinary papers. Special characteristics are required. And these characteristics vary with different types of products, different methods of packing. The correct paper in one situation often leads to trouble in others. Special papers have now been perfected by the Paterson Parchment Paper Company to meet the different problems. These papers vary in characteristics. They come in many weights and finishes. Chances are that one of them will exactly suit YOUR requirements. We invite you to consult with us. When writing kindly give full details about your pack.

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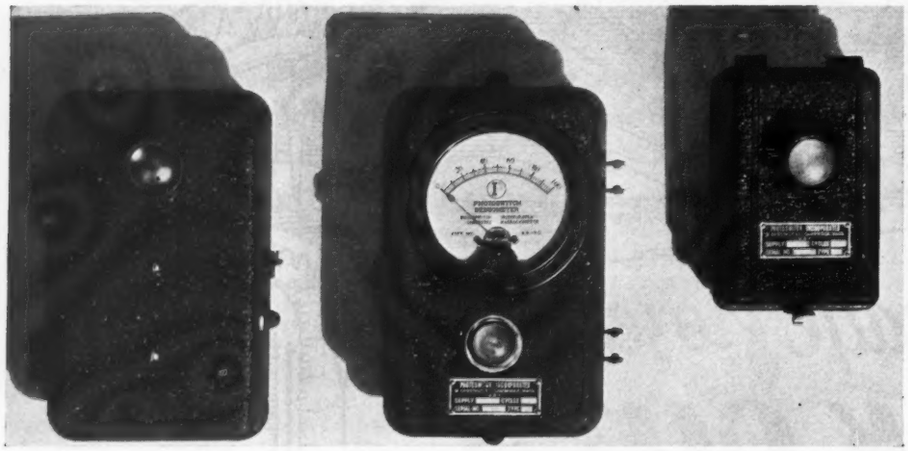
PATERSON PARCHMENT PAPER COMPANY

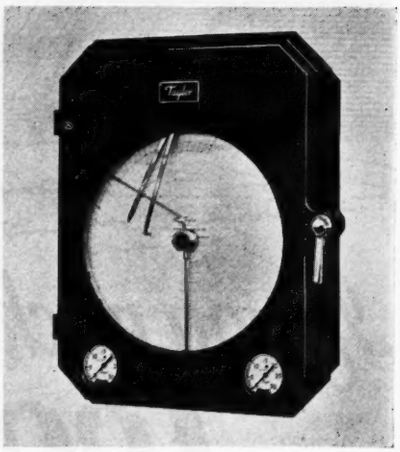
Bristol, Pennsylvania

West Coast Plant: 340 Bryant Street, San Francisco, California

Branch Offices: 120 Broadway, New York, N. Y. 111 West Washington Street, Chicago, Ill.



Apparatus used in smoke control



Control instrument with "Pre-Act"

additional equipment than a circuit breaker. Both are powered by 6-cylinder heavy-duty diesel engines said to require a minimum of maintenance and adjustment. The manufacturer claims that these sets can be installed and running within one hour after delivery.

Excess Smoke Signal

PHOTOSWITCH, INC., 21 Chestnut St., Cambridge, Mass., has improved its smoke alarm equipment by the addition of the "Densometer" which continuously indicates smoke density on a 4¾ in. dial and lights a red signal lamp when smoke density exceeds the set point.

Referring to the photograph, the set-up consists of (reading from left to right) photoelectric control, Densometer-signal combination, and light source. The light source and the photoelectric control are mounted on opposite sides of the flue or breeching, and are aligned through simple entrance tubes or windows so that the beam from the light strikes the eye of the control. The Densometer may be placed at any convenient location in the boiler room, usually near the furnace controls, and is wired to the photoelectric control.

Vacuum Capping Machine

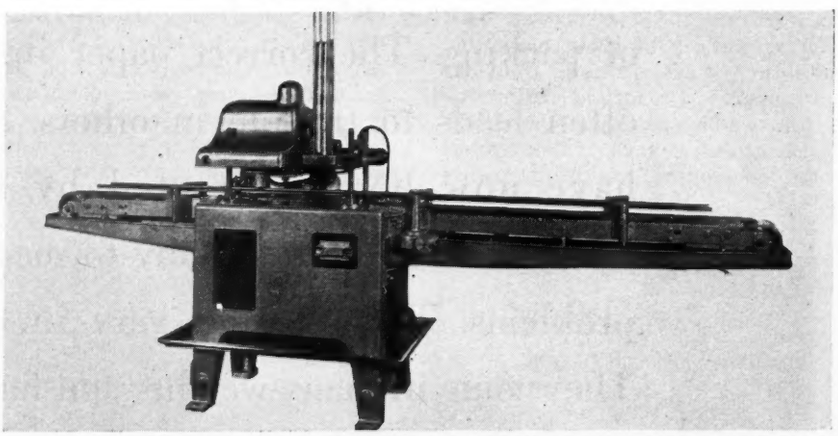
A STEAM VACUUM CAPPING MACHINE for closing glass containers has been brought out by Anchor Cap & Closure Corp., Long Island City, N. Y. It is designed to apply the Anchor Hocking Vacuum Cap on tumblers, jars and bottles, with or without a pry-off ledge, and with any desired degree of vacuum from 2 to 28 in. It operates on 15 lb. steam pressure.

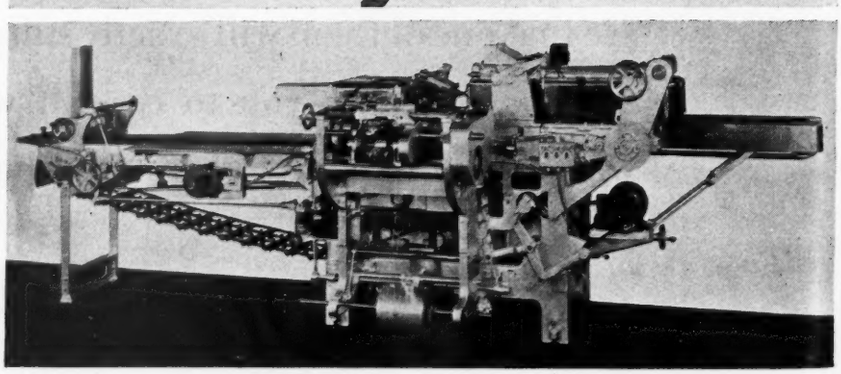
A feature of the machine is a fully automatic cap feed. In changing from one size of container and closure to another, only four adjustments are necessary. In the standard model, the machine will close all sizes and shapes of tumblers, jars and bottles with the A.H. finish from 2 to 10½ in. in height with caps from 38 mm. to 83 mm. Machines for other ranges can be supplied.

Cake Wrapping Machine

BATTLE CREEK BREAD WRAPPING MACHINE CO., Battle Creek, Mich., has developed a high speed cake wrapping machine designed to handle practically all types and sizes of cakes at speeds of 40 to 65 units per minute. Designated Model 40-UF, this machine will fold and seal transparent wrapping sheet on the bottom of the cake or cardboard, or against the ends of the cake, as desired.

Flexibility has been stressed in the design of this cake wrapper. It can be changed from one size of package to another in from 10 to 15 minutes over a wide range of cake sizes, from





Above—Steam vacuum capping machine for glass containers

Below—Cake wrapping machine equipped with automatic cardboard feeder, code dater, labeling device and variable speed drive.

3 to 13 in. long, 2¼ to 5¼ in. wide and ½ to 4 in. high.

Attachments available on this wrapper include an automatic cardboard feeder, an automatic label affixing device which glues labels to the outside of the wrapping sheet, a variable speed drive, and a code dating attachment. By means of an "electric eye" attachment, printed wrappers can be handled and made to register around the cake.

With this machine, cardboard supports of appropriate size are automatically fed and dated. A strip of sheeting of correct size, to which may be attached either an identifying band or a decorative label, is fed out, folded around the cake and heat-sealed. Only one operator is required to feed cakes to the in-going conveyor.

Control Instruments

TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y., have introduced a complete new line of "Fulscope" air-operated recording and indicating controllers for temperature, pressure, flow and liquid level. In addition to combining in one instrument the proportional response and automatic reset forms of control, a new process-control effect, the "Pre-Act," is introduced. This is a feature which makes control valve corrections according to the rate of control-point deviation. In response to sudden disturbances in the process or variations in the controlling medium, over-peaking or oscillation is greatly reduced by an immediate and relatively larger control valve action than would otherwise occur. Also, operation is stabilized after a change in set point and when equipment is started.

In these instruments, continuous controller sensitivity (throttling range) adjustments over a wider range assure adaptability to any process time lag. Fully automatic sensitivity reduction gives consistent performance throughout the sensitivity range and provides inherent compensation for fluctuations in air-supply pressure. Ease in making adjustments in sensitivity, automatic reset rate and "Pre-Act" time is provided by magnified dials, calibrated in absolute units.

These instruments are available in five standard types: Fixed high sensitivity; adjustable sensitivity; adjustable sensitivity with automatic reset; adjustable sensitivity with "Pre-Act"; and adjustable sensitivity with automatic reset and "Pre-Act."

Diesel Electric Generator

"POWER-PAK" is the name of a line of diesel electric generating plants, ranging from 3,600 to 24,000 watts, being marketed by Lister-Blackstone, Inc., 1706 So. 68th St., Milwaukee, Wis. Compact, space-saving design characterizes these power plants, which consist of a radiator-cooled engine, a generator and a control panel. To save space, the generator is placed beneath the engine. Generators are available in any desired voltage or current, for stationary or marine service.

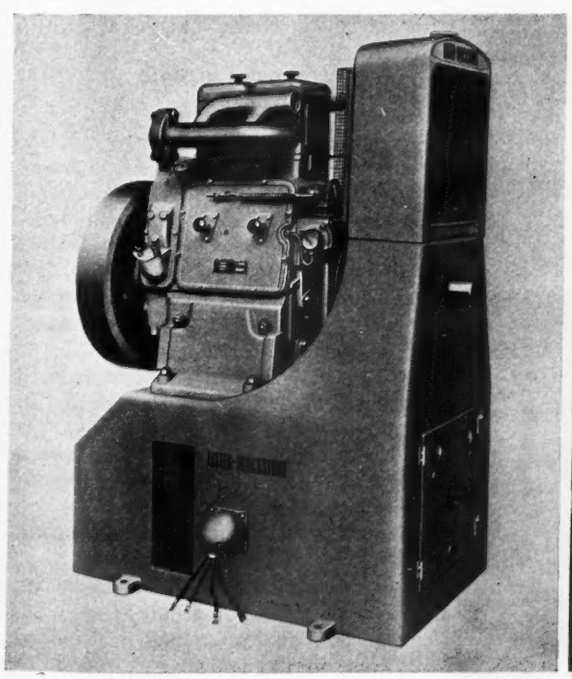
Motor Truck Oil

DESIGNED especially to overcome certain difficulties met with in lubricating diesel and heavy duty gasoline engines of trucks, Texas Co., 135 E. 42d St., New York, N. Y., has brought out Texaco 303 Motor Oil. The purpose of this oil is to eliminate the clogging of filters, screens and oil lines in modern heavy-duty engines. It is claimed that the new oil will not break down under the higher speeds, pressures and temperatures encountered in these engines, that it assures cleaner engines, no sludge deposits, and higher efficiency over long periods of continuous operation. It is said that corrosion of bearing metals is prevented through the use of this oil and that maintenance is less.

Fork Lift Truck

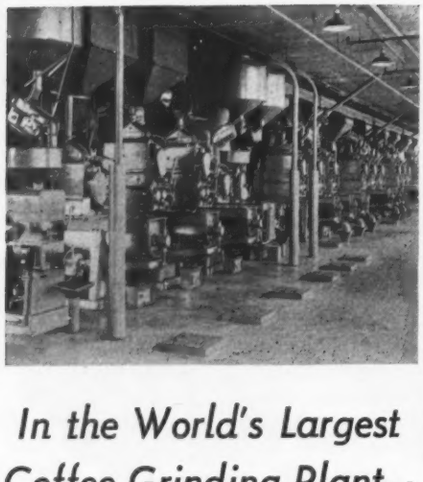
ELWELL-PARKER ELECTRIC Co., Cleveland, Ohio, has brought out Model F-14, the smallest of a series of center control electric storage battery industrial trucks so designed that the operator sits in the center of the truck, immediately behind the load. This enables the operator to see better where he is going and to lift and stack materials with more precision.

This "Cen-trol" truck has a 46-in. turning radius, enabling it to operate in cramped areas. It passes through doors 4½ ft. high, traverses aisles 48 in. wide, can turn completely around inside a box car, and travels under load on plant elevators and ramps. Equipped with forks, it can transport loads of 2,000 lb. on pallets or skids.



Diesel electric generator set

Small 2,000 lb. capacity center control industrial truck



In the World's Largest Coffee Grinding Plant—

Twenty-one (21) Gump Granulizers are used for the production of modern, scientific grinds, ranging in size from pulverized to coarse steel-cut. Repeated tests have proved the ability of these Granulizers to produce uniform, clean cut, cool grinds to pre-tested formula, consistently, day after day—month after month.

• • • •

Uniform grinds, determined by cup test to be the most suitable grind for each particular method of brewing coffee, is a sales and "good-will" builder that the progressive roaster cannot afford to ignore.

A User Says—

"We are pleased to advise that the Granulizer is giving the very best of service and turning out a wonderful product. We feel sure it has been the means of helping us increase our coffee business."

Check your grinds and your production costs. Compare them with Granulized coffee and the cost of a Granulizer. Like many others, you will undoubtedly be quick to see the all around advantages to be gained by installing one or more of these efficient machines. Recommendations, prices, and engineering assistance furnished without cost or obligation, upon request.

Food Plant Equipment

Complete information on other specialized units, suitable for grinding, sifting, mixing, weighing and packing of dried, powdered, or granular food products furnished on request.

Write for catalogs today.

B.F.Gump Co

Established 1872

454 S. CLINTON ST., CHICAGO, ILL.

Non-slip Pulley Covering

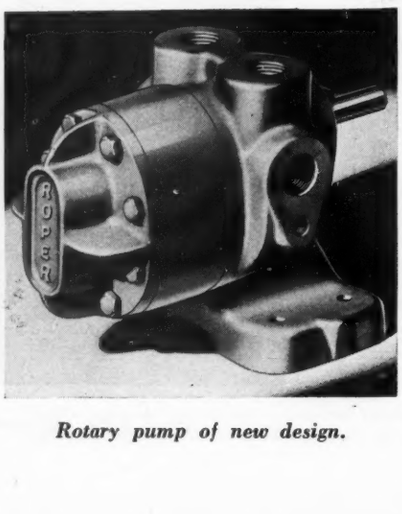
NONSLIP PULLEY COVERING CO., 777 Hertel Ave., Buffalo, N. Y., is making a product to be applied to the face of pulleys to prevent belt slippage. This comes in sheets 9 ft. square. To apply, it is torn in strips of the proper width and length to go twice around the pulley, including the lapping. The pulley is then thoroughly cleaned. Then the material is soaked in hot water long enough to soften it, after which it is wrapped tightly around the pulley. One application is said to last about two years and practically to eliminate belt slippage.

Screw-In Socket Fluorescent Lamp

VAN DYKE INDUSTRIES, 2900 S. Halsted St., Chicago, are making a new screw-in socket fluorescent lamp, designated as No. 3001. This is an entirely self-contained unit, designed to be inserted in any light bulb socket. Its purpose is for general illumination, particularly in such applications as food plants where cool, efficient lighting is desired. It is finished in baked-on Morocco brown and provided with a "Colortone" reflector. This lamp is available in several sizes for operation on a.c. current only.

Rotary Pump

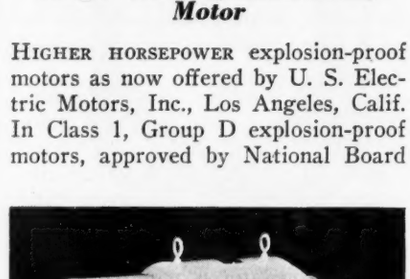
GEORGE D. ROPER CORP., Rockford, Ill., has brought out a new line of rotary pumps. This line covers a wide range of 7,000 different units including pumps from 1 to 1,000 g.p.m. capacity with speeds up to 1800 r.p.m. and for operation against heads up to 1,000 lb. per sq.in. Twenty-one different types of drives and mountings are available, ranging from ordinary foot hub and flange mounting heads to complete baseplate units for direct motor drive, gear reduction, flat or V-belt drive. In design, these pumps feature a "hydraulic balance," which is said to equalize internal pressure at all points and absorb all shock or thrust from the power end of the drive thrust. With these pumps, various types of gearing, packing boxes or seals, bearings, relief valves and piping arrangements are available to suit the installation.



Rotary pump of new design.

Large Size Explosion-Proof Motor

HIGHER HORSEPOWER explosion-proof motors as now offered by U. S. Electric Motors, Inc., Los Angeles, Calif. In Class 1, Group D explosion-proof motors, approved by National Board of Fire Underwriters, ratings have been raised from 25 to 75 hp., while in Class 2, Group G, they have been increased from 7½ to 75 hp. These larger motors are of shell-type frame construction and have a fan designed for quiet operation at high speeds. A large terminal box is available for convenient wiring. Special attention has been made in this design for ease of assembly or disassembly.



Large size explosion proof motor

New Tinplate

PITTSBURGH CRUCIBLE STEEL CO., Pittsburgh, Pa., is producing tinplate suitable for can manufacture by means of a new electrolytic process. Claims made for this product include freedom from pin holes or porosity in the surface coating, and complete adaptability to can makers processes of shaping, seaming, soldering, lacquering and lithographing.

This new tinplate is a cold reduced product, made in coils ranging in length from 4,000 to 7,000 ft. It is furnished to customers cut into sheets, or in coils of various lengths and widths, as desired. Temper is also variable to suit customer requirements. Availability in coils is said to make possible a saving in scrap production in some cases of from 3 to 6 per cent and also a saving in handling by use of mechanical roller feeds.

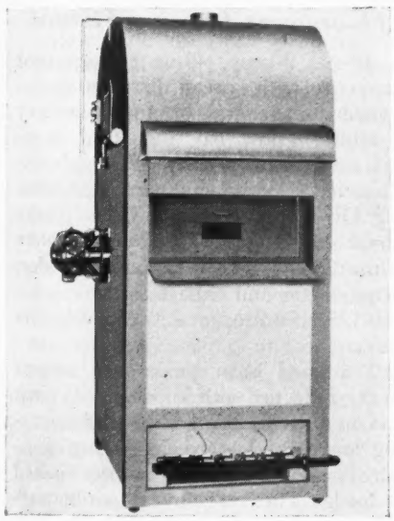
The process of manufacture of this tin plate consists of depositing on the

surface of the steel by electro-deposition a pure tin coating of uniform thickness, with variation when measured by weight said to be not over 10 per cent plus or minus, compared to variations of 50 per cent plus or minus on tinplate made by the hot-dipped process.

This new tinplate is made in three grades: "Crutin Regular" particularly adapted to high acid packs; "Crutin Light," suitable for dry packs and similar purposes; and "Crutin Special," which has a copper alloy base coating under the tin coating, is of high corrosion resistance, and finds many specialized applications.

Small Baking Oven

A VERTICAL traveling oven, said to have capacity equal to other ovens occupying three times as much floor space, has been developed by Bakers Ovens Co., 619 E. Pearl St., Cincinnati, Ohio, under the trade name of "Volumiget". This is a gas-fired unit, 7 ft. 9 in. in height and mounted on casters. The conveyor is motor-operated and consists of non-tilting



Small unit bake oven of traveling tray type.

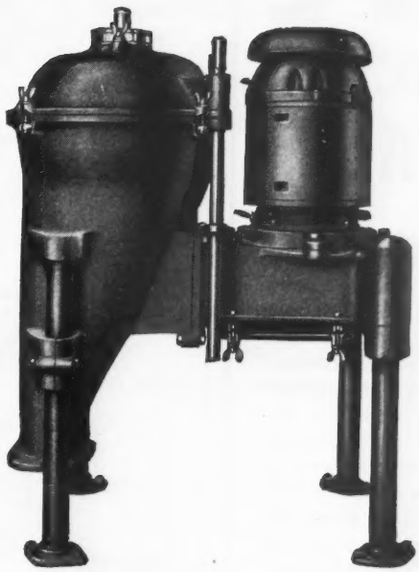
trays so arranged as to be level at all times throughout their travel. It is fully insulated and inclosed in a casing of modern design. A timing clock for operation control is provided. Dampers at the curved heat reflecting top are hand-operated for adjustment in providing uniform heat. The oven is equipped with a steam spray for use in baking special bread.

This small oven is said to be suitable for producing all types of baked goods. It occupies a floor space of approximately 12 sq. ft. and is suitable for placing in any convenient location.

INSECT INFESTATION DESTROYED

BY THE NEW BULK FLOUR

ENTOLETER
INFESTATION DESTROYER
REG. U. S. PAT. OFF.



INSECT LIFE IN ALL STAGES: EGG, LARVA, PUPA AND ADULT IS DESTROYED *MECHANICALLY* JUST BEFORE THE FLOUR PASSES TO THE PACKERS.

ENTOLETE *your flour*
DESTROY INSECT INFESTATION AS PART OF THE MILLING PROCESS

Inexpensive
Easy to install and operate
Minimum Maintenance

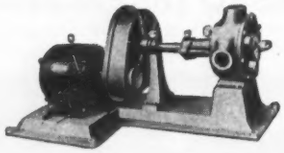
ENTOLETER DIVISION
THE SAFETY CAR HEATING AND LIGHTING COMPANY, INC.
230 PARK AVENUE NEW YORK, N. Y.

SAVE

A PUMPING HOUR

A DAY

From the time you replace worn-out pumping equipment with new Viking Rotary Pumps you start saving up to an hour or more a day in pumping time. To match the speed of present day production in modern Food Factories, Viking units are designed and built to accurately handle swift-moving pumping schedules at less cost and ON TIME. Bulletin 103-35 gives you the "inside story" on Viking standard stationary and portable models, complete specifications on drive arrangements —mountings and capacities. Write for a copy.



VIKING'S TRADE MARK YOUR GUARANTEE

VIKING PUMP COMPANY

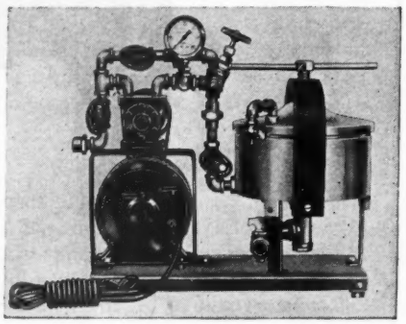
CEDAR FALLS, IOWA

Drying Lamps

GENERAL ELECTRIC Co., Nela Park, Cleveland, Ohio, has developed a complete line of drying lamps, designed to produce effective heat rays instead of light and for use in the drying of foodstuffs and kindred products. These lamps are available in four sizes: a 1,000-watt unit, a 500-watt unit, and two 250-watt units, one of which is designed for use with the special reflector equipment that is used with the 1,000- and 500-watt lamps and other having its own reflector built into the bulb. All of these lamps are designed for operation at 105 to 120 volts. The two small units are for use with screw sockets, while the larger two units are of "bipost" construction. It is said that the average laboratory life of these lamps has proved to be in excess of 5,000 hours of operation.

Laboratory Filter

A HORIZONTAL plate type filter for laboratory use has been announced by Sparkler Mfg. Co., 1210 Webster Ave., Chicago, Ill. It operates by



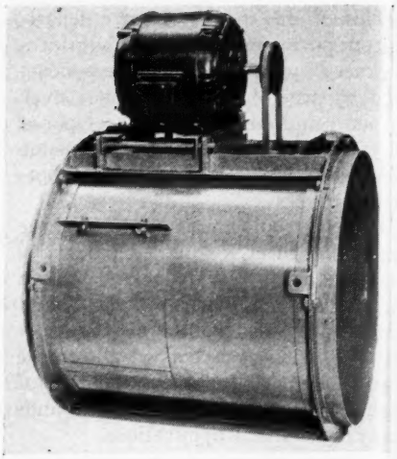
Horizontal plate type laboratory filter

hydrostatic pressure, air pressure, gas pressure or vacuum. It is designed to handle viscous materials as well as aqueous solutions in quantities from one pint up to flow rates from 1 to 150 gal. per hour. This filter is designed for use with all known filter mediums.

Construction consists of three horizontal plates, 8 in. in diameter, mounted in a cylindrical tank with single clamp cover. Filtering area is one square foot, with cake space of 144 cu. in. Two pounds of filter aid is accommodated. A $\frac{1}{4}$ hp. motor drives the liquid pump, which can be used for transfer purposes if desired. Another feature is ready accessibility for cleaning.

Straight-Line Exhauster

FOR HANDLING air containing steam, dirt, fumes, vapors and so on, a straight-line exhauster has been developed by L. J. Wing Mfg. Co., 154 W. 14th St., New York City. This



Exhauster for handling air containing steam, dust or fumes.

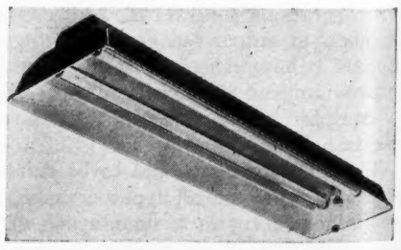
exhauster is available in horizontal or vertical design, with a belt-drive which permits selection of any fan speed to fit conditions of air volume and resistance. The motor is located outside of the air duct, to keep it clean and cool and to reduce fire hazards when inflammable mixtures are being handled.

Fluorescent Lighting Fixture

A 48-IN., 2-lamp, 40-watt fluorescent luminaire with spread distribution designed for general or supplementary lighting in low bay industrial areas has been developed by Westinghouse Electric & Manufacturing Co., Lighting Division, Cleveland, Ohio. These units are furnished wired complete with hood, reflector, lamp holder, lamp starter and ballast equipment for 110-125, 199-216, or 220-250 volt circuits.

The hood is of sheet steel hinged to the reflector with knockouts at each end to provide for end-to-end mounting and straight-through wiring. Finish is of smooth silver-gray baked enamel. The reflector is white porcelain enameled steel, and has an over-all efficiency of 78 per cent with a cut-off of 72½ deg. from vertical when viewed normal to the lamp.

Units are arranged for rigid conduit, flexible conduit, or chain suspension mounting.



Twin-lamp fluorescent luminaire with porcelain enameled reflector

Water, Oil and Dust-tight Switch

MICRO SWITCH CORP., Freeport, Ill., has developed a water, oil and dust-tight switch which is said to embody all the characteristics of precision and long life found in other switches made

Oil, water and dust-tight switch

by this company. The new switch is equipped with a die-cast metal housing and a molded Neoprene seal surrounds the plunger mechanism. Also, the base plate of the housing is provided with a gasket. The switch is designed for use with ½ in. diameter conduit and will handle up to No. 14 solid wire in its terminals.

Laboratory Mixer

CHEMICAL PUBLISHING CO., INC., 148 Lafayette St., New York, is distributing a new model of "Power-Mix", a small mixer designed for laboratory use. This has been developed with a Monel metal supporting arm which fits into any clamp and allows the mixer to be adjusted at any angle desired. The mixer has a big variation from zero to 1350 r.p.m. It is equipped to guard against injury from overloading and has an explosion-proof motor. It is also designed for continuous operation and is said to be able to run 24 hours continuously without damage. No lubrication is required.

Twisted Cruller Machine

J. C. BOURQUIN, 34 Dartmouth Place, Elm Hill, New Britain, Conn., has developed an automatic machine for shaping dough into twisted crullers. The present model has a capacity of 2,400 twisted crullers per hour and takes batches of 25 lb. of dough. It is designed to operate with any prepared flour or with the baker's own mix. A ¼ hp. motor drives the machine. Floor space required is 1½x4 ft. Larger and smaller models can be constructed if desired.

AN EASY WAY

TO PREVENT WASTE *IN FOOD PROCESSING*

MOTOCO Indicating Thermometers have rigid stem for direct mounting or capillary tubing for remote reading. Priced from

$20

Temperature variations in food processing may result in production tie-ups; in excessive heating or cooling costs; in spoilage; complaints or "rejects". All of these restrict net profits and hamper business growth.

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The simple, inexpensive solution to these problems is to use MOTOCO Indicating and Recording Thermometers at all points in the plant where temperature is important . . . let them show you where waste and loss are occurring.

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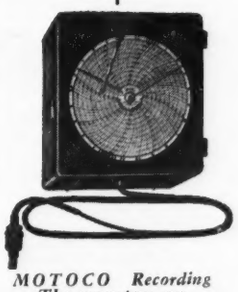
MOTOCO Dial-type Thermometers are precision-built for accuracy . . . their solid construction assures long and economical service. Invest in MOTOCO Thermometers and profit from increased efficiency . . . NOW. Send a letter or post card today, requesting MOTOCO folder which gives full information. We shall be glad to submit recommendations for your particular requirements. Moto Meter Gauge & Equipment Division, The Electric Auto-Lite Company, Chrysler Bldg., New York, N. Y.



MOTOCO Recording Thermometers are priced from

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√ **FOR BAKING TEMPERATURE . . .**
√ **FOR SMOKEHOUSE TEMPERATURE . . .**
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√ **FOR DRYING ROOM TEMPERATURE . . .**
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MOTOCO

INDUSTRIAL THERMOMETERS

Food Technology

NEW DISCOVERIES & INVENTIONS

FOOD TECHNOLOGY

Determining Emulsifying Efficiencies

THE PROBLEM of testing emulsifying equipment is essentially one of determining the particle-size distribution in a given emulsion. The important methods used for this purpose may be divided into three general classes:

1. A combination of diffusion and sedimentation methods, requiring considerable time or expensive centrifuging equipment.
2. Determination of size and shape of individual particles with an expensive ultramicroscope.
3. Measuring of the intensity of light transmitted through an emulsion, with an inexpensive turbidimeter.

A method has been developed with a view to simplicity of apparatus and rapidity and ease of measurement. The apparatus and procedure for the new method of determining emulsifying efficiency (based on turbidity measurement) are described, together with a convenient standard emulsion. The new method is compared with microscopic examination and with the measurement of the time of creaming of the emulsions. Results on a colloid mill, a homogenizer and a new type of emulsifier are presented.

A bibliography on methods of particle-size analysis applicable to the study of emulsions and suspensions is included.

Digest of "Determining Emulsifying Efficiencies," by Leonard H. Cohan and Norman Hackerman, Colloid Corp., Baltimore, Md., from Analytical Edition of *Industrial and Engineering Chemistry*, April, 1940.

Errors in the Plate Count Of Bacteria

THERE ARE two main errors in the usual plate method of counting bacteria. The distribution error, i.e., variation in counts between a number of plates, is due to sampling errors, lack of uniformity of the solution sampled and crowding of bacteria on the plate. Distribution error is well known and is kept low by arranging dilutions so as to get between 100 and 400 bacterial colonies per plate. The probable distribution error can be calculated mathematically by taking a sufficient number of plates and determining the standard deviation of the mean. With good technic it may amount to about 5 percent either way —plus or minus.

The second error, commonly considered unimportant, is due to errors in diluting. Actually this is about as great as that due to distribution. It also increases as more dilutions are made. By invoking the aid of differential and integral calculus you can get a formula which gives the percentage error. Assume good technic and errors of 1 percent in pipettes and diluting, and that there are m dilutions at 9 milliliters and n dilutions at 99 milliliters. Then the percentage error is equal to plus or minus the square root of the sum of $(m+n)^2+m^2+n^2$. The authors give a table of errors covering most possible combinations of dilutions from one-tenth to one-hundred-millionth.

Knowing the two errors, the total percentage of error equals the square root of the sum of the squares of the two errors. Thus with a distribution error of 5 percent and a dilution error of 4.2 percent, the total error is plus or minus 6.6 percent. In other words, there are seven chances in ten that the true count is within 6.6 percent of that found experimentally.

Digest from "Evaluation of the Errors Involved in Estimating Bacterial Numbers by the Plating Method," by Marshall W. Jennison and George P. Wadsworth, *Journal of Bacteriology* 39, 389, 1940.

SPICES

Keeping Quality of Spices

TO TEST the keeping quality of packaged ground spices, storage tests of six and ten months were carried out with cinnamon, allspice, cardamom (seeds and fruits) and white pepper. The containers were yellow paper, parchment paper and transparent cellulose bags, tin plate canisters and metal-capped glass tubes. Three determinations of essential oil content were made: (1) When packaged; (2) after six months; (3) after ten months.

The results show that common yellow paper is not a satisfactory wrapper for the spices included in the tests, and it is considered safe to extend this conclusion to spices in general. Glass tubes, metal capped or otherwise well closed (cork stoppers are considered acceptable), keep the spices in good condition, with only small losses in essential oil content at six months and only moderate losses at ten months. But, since glass presents a breakage hazard, parchment paper or transparent cellulose may be preferred. Both of these wrapping materials proved nearly or quite equal to glass in their ability to retain the essential oils in the tested spices. Tin canisters keep the spices well, but they are likely to rust in damp atmospheres and are less convenient than parchment paper or transparent cellulose wrappers.

Cinnamon kept better than expected in common paper, perhaps partly because the test conditions were not exactly like practical exposure conditions and partly because grinding methods have been more to blame for deterioration than have the wrappers. White pepper lost nearly all its essential oil but still retained its sharp taste because it had not lost its piperine and resin components.

Digest from "Keeping Quality of Packaged Ground Spices," by C. Griebel and G. Hess, *Veitschrift für Untersuchung der Lebensmittel* 79, 184, 1940 (Published in Germany).

BAKING & MILLING

Manganese and Zinc In Rye Bread

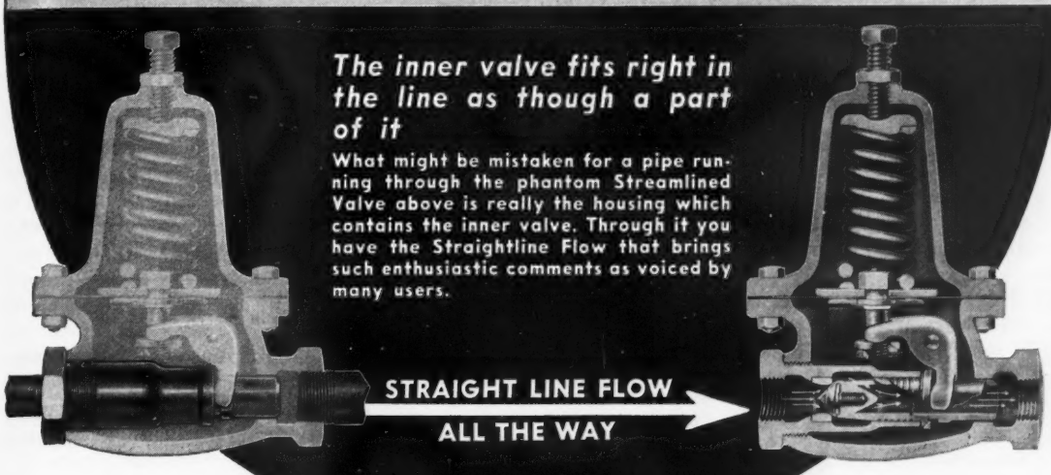
ALTHOUGH the human body contains only about 20 parts per million of zinc and less than 1 p.p.m. of manganese, these elements are essential and must be present in the diet. Both manganese and zinc are commonly present in plants. Rye flour and bread have therefore been analyzed to ascertain how much of each metal they contain.

The tests were made in five different lots of commercial 95 percent rye flour, and in bread made from these

"Speeded Up OPERATIONS ABOUT 20 TO 25%"

Note—SIMILAR RESULTS BEING EXPERIENCED BY WIDE VARIETY OF USERS

"We are glad to tell you that your Streamlined 1000-LP Valve has enabled us to speed up operation on our Hosiery Setting Machine about 20 to 25%. This is because your Valve gives such rapid action in bringing up the pressure and in holding the pressure constant during the preboarding operation."



The inner valve fits right in the line as though a part of it

What might be mistaken for a pipe running through the phantom Streamlined Valve above is really the housing which contains the inner valve. Through it you have the Straightline Flow that brings such enthusiastic comments as voiced by many users.

CASH STANDARD *Streamlined* TYPE 1000 PRESSURE REDUCING VALVE

A valuable tool to help you speed operations, cut maintenance, save money

VALVE TURBULENCE ELIMINATED

The valve increases performance results by eliminating the ordinary valve turbulence indicated in illustration above. There is no detour around a dividing wall—the direction of flow is not changed at right angles because of a seat wall—also, the flow is not broken up by valve stems, springs, or other parts.

REDUCED PRESSURE NEVER VARIES

You get Streamlined flow as indicated in illustration above. Because of this Streamlined flow and no turbulence, you are easily able to meet peak demand and yet hold the reduced pressure constant at the same time. You experience no spoilage results due to erratic pressure—because the reduced pressure never varies.

Free **TRIAL** **Prove for yourself what others say about CASH STANDARD Streamlined Valves—do it at no cost—tell us to ship one to you on 30 days' free trial—after 30 days you get a bill—you either pay for it then or return valve to us at our expense—order one on trial today—see why there are no failures—decreased attention costs—no heat or chemical troubles.**

BULLETIN 1000 TELLS COMPLETE STORY

You may select a CASH STANDARD Streamlined Valve exactly suited for your service conditions. Bulletin 1000 shows how. Any combination of metals can be obtained for body, trim, valve seat, and seat ring. Handwheels for quick pressure adjustment also available.

IMPORTANT CHARTS SHOWN IN BULLETIN 1000

Steam, air, water capacity charts for all Streamlined Type 1000 Valves are shown in Bulletin 1000. These charts are easy to use—they enable you to determine precisely how much fluid any size Streamlined Valve will deliver under your exact pressure conditions—for steam, air (and other gases), water (and other liquids).

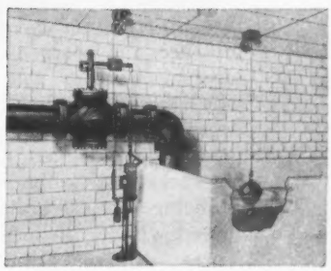
CASH STANDARD CONTROLS . . VALVES

A. W. CASH COMPANY
DECATUR, ILLINOIS

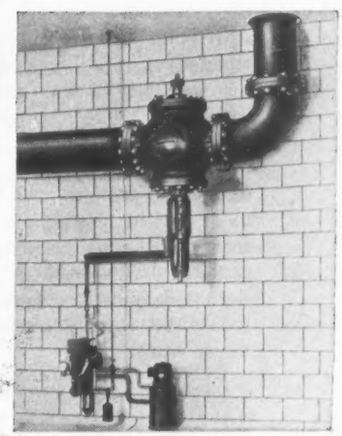
A CASH STANDARD "GET ACQUAINTED" COLUMN

Question: **"Don't you people make anything besides that Streamlined Valve you talk about so much?"**

Answer: **"Yes Sir; we do! And we propose to picture one or two of them here each time."**



In automatic liquid level control, two things are often of prime importance: (1) to hold the level within the closest kind of limits; (2) to do it dependably, day by day. How Cash Standard controls do both is shown above. A Type 100-L Controller operates a 12" Balanced Valve regulating liquid supply to a large tank. It is pilot actuated for sensitivity. It has operating power to spare—for any size Valve, however large.



Here, a Type 100-L Controller operates a 10" Cash Standard Balanced Valve. It regulates flow through a make-up line to a "dirty water" heater on the floor above. The lever of the "100-L" responds to slightest movement of a float in the heater—causing immediate movement of the power piston which operates the Valve. But there is no "hunting" because the Controller is fully compensated. It has a "range" adjustment too. It gets accurate results with any size valve—no matter how small or how large the valve may be. It is simply a matter of using the right size power cylinder.

Get Free Bulletins on Above . . . Write to
A. W. CASH COMPANY
DECATUR, ILL.

flours. Calculated on the moisture-free basis, the flour samples contained from 10.5 to 13.4 p.p.m. of zinc The bread samples contained a little more, presumably because the yeast and salt used in making dough contained traces of zinc.

The manganese content ranged from 22.1 to 29.3 p.p.m., or a little more than twice the zinc content. In this case also the bread contained slightly more of the metal than did the flour, again attributable to the yeast and salt. Refined salt may contain, for example, as much as 250 p.p.m. of manganese.

Digest from "Manganese and Zinc Content of Rye Flour and Bread," by M. N. Tul'chinskii, *Voprosy Pitaniya*, 9, 44, 1940 (Published in Russia).

Wheat in Storage

COMPARATIVE STUDIES of after-ripening in freshly harvested wheat, in presence and absence of atmospheric oxygen, indicate that the changes which occur in a wheat grain do not depend on oxygen. The tests were made in wide glass tubes sealed by stopcocks so that the atmosphere surrounding the test grains could be renewed without disturbing the sample. Three different atmospheres were used; namely, oxygen, nitrogen and carbon dioxide. Every three days during a test the gas in the tube was swept out and replaced by fresh gas.

After-ripening effect was measured in terms of enzyme activity and germination behavior. The enzymes for which activity was measured were catalase and tyrosinase. Wheat grains stored in an atmosphere of oxygen ripened as rapidly as those stored in nitrogen or carbon dioxide, but no more so. The changes in enzyme activity and the power to germinate developed quite as well without oxygen as with it. All the tests were made with wheats not containing more than the permissible moisture content (15 percent in Russia), and do not demonstrate that after-ripening would be equally anaerobic in very moist wheat.

Digest from "Influence of Relative Air Humidity and Anaerobiosis on Freshly Harvested Wheat Grains," by V. L. Kretovich, A. I. Sokolova and E. N. Ushakova, *Comptes rendus (Doklady) de l'Academie des Sciences de l'URSS* 26, 287, 1940 (Published in Russia).

CANNING & PRESERVING

Heat Penetration Affected by Viscosity

TOMATO JUICE appears to be a much slower heating product than has been formerly believed. Changes in viscosity which, generally speaking, are greater in the beginning of the season than later on, were found to affect the temperature-lag period at the start of processing more than the rate of heat penetration. Juice of heavy consistency had a lag period of 20 to 30 minutes, compared with 15 to 20 minutes for low viscosity juices.

Cans processed in boiling water showed a greater degree of variation in the rate of heat penetration and temperature-lag period than those processed in steam. In general, cans processed in boiling water had shorter temperature-lag periods and faster rates of heat penetration than those processed in steam at 214 deg. F. When bubbling and vibration were prevented in the steam retort, both procedures checked well.

Average Time for Tomato Juice In Cans To Reach a Given Temperature

Can size	Initial temperature	Time to reach 185° F.	Time to reach 190° F.
No. 300	180	17	21
	170	22	26
	160	26	23
No. 303	180	18	22
	170	24	30
	160	29	36
No. 307	180	15	21
	170	26	32
	160	32	42
No. 401	180	20	28
	170	35	45
	160	45	55
No. 404 cylinder	180	24	33
	170	36	45
	160	46	55
No. 502 × 510	180	34	55
	170	67	95
	160	..	..
No. 10	180	38	72
	170	89	..
	160	..	..

In small cans the rate of heat penetration is fairly constant and well defined. These cans lose appreciable amounts of heat between the time they are closed and the time they are placed into the retort. Juice packed in 404x700 cans or larger, especially in No. 10 cans, heats so slowly that higher retort temperatures or mechanical agitation might be advantageously employed in order to shorten the processing period. Where this is not practical, high initial temperatures should be used.

Digest from "The Rate of Heat Penetration in Canned Tomato Juice," presented by L. J. Frost before National Canners Convention at Chicago, January, 1940.

Removing Lead and Arsenic From Fruit Juices

GRAPE, berry and fruit juices, especially those containing arsenic or lead from insecticides, are purified and at the same time improved in sparkle and clarity by treatment with a solid adsorbent. The invention, which is equally applicable to wines made from the juices, is divided into three parts, each covered by a German patent (all assigned to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-Main, Germany).

In German Patent 679,646 (granted Aug. 10, 1939, to B. Wullhorst, J. Burkard and K. Hennig), the juice or wine is treated 8 days with amorphous iron oxides, then filtered. The oxides are prepared by heating iron hydroxide hot enough to dry it but not to calcine it.

In German Patent 679,647 (granted Aug. 29, 1939, to K. Hennig and E. Korinth), crystalline activated iron oxides are employed, in the presence or absence of alumina. The oxides are prepared by heating hydrated iron oxide at 390 to 750 deg. F. in a vacuum or in an atmosphere of inert gas.

In German Patent 679,969 (granted Aug. 18, 1939, to E. Sailer), the treatment is modified by warming the juice or wine at 105 to 120 deg. F. during adsorption.

DAIRY PRODUCTS

Rare Proteins in Whey

SINCE milk contains a considerable quantity of proteins other than casein, and coagulation of casein leaves much of the remaining protein in soluble form, whey is an important source of proteins. In an elaborate investigation of these whey proteins, several components have been isolated by fractional crystallization or fractional coagulation.

One of the main fractions is named "lactomucin" because it resembles mucin. This in turn was separated into two fractions, one containing a green and the other a red color principle. The green fraction is tryptophane-poor while the red fraction is rich in tryptophane.

Three other fractions were isolated, all of them more soluble than lactomucin in aqueous ammonium sulphate solution. One is a globulin, readily prepared in crystalline form by a method described by A. H. Palmer in 1934. This globulin is nearly insoluble in water. The next fraction is a gelatinous protein which is soluble in water. The third is insoluble in water.

The proportions of these fractions in whey proteins vary a great deal, but in general it can be said that the water-insoluble globulin accounts for about half while the water-soluble gelatinous protein and the water-insoluble last fraction constitute 10 per cent each of the total whey proteins. The globulin can be converted into the gelatinous protein by treatment with ammonium sulphate in acid solution, but the water-insoluble fraction is not convertible either into the globulin or the gelatinous protein.

Digest from "Proteins in Whey," by Margrethe and S. P. L. Sorenson, *Comptes rendus du laboratorire Carlsberg*, Serie Chimique, **23**, 55, 1939 (Published in Denmark).

New Alloys for Milk Equipment

STAINLESS (CHROME-NICKEL) STEEL is very desirable in dairy equipment as its use avoids the development of oxidized flavor due to copper contamination. It has the disadvantage of being relatively difficult to cast and machine, especially for fittings, valves and bearings. In trying to get something more workable yet noncorrodable, some seven alloys were tested, both for corrosion and effect on flavor. These were, essentially, copper (62 to 66½ percent) and nickel (20 to 31 percent), plus lesser and varying amounts of tin, lead, zinc, iron, manganese and chromium. The most satisfactory in respect to absence of corrosion, absence of off-flavors, cost and workability consisted of: copper 66, nickel 20, tin 3, lead 4, zinc 4, iron 2½, manganese ½. The presence of tin and zinc lowers corrosion and decreases the amount of copper passing into solution.

Digest from "The Influence of 'White Metal' Copper-Nickel Alloys on the Flavor of Milk," by J. L. Henderson and C. L. Roadhouse, *Journal of Dairy Science* **23**, 215, 1940.

FATS & OILS

Dextrine in Oil Emulsions

TESTS with a dextrine made by hydrolysis of potato starch showed it to be an effective substitute for gum arabic as an emulsion stabilizer in fatty oil emulsions. The emulsification procedure is to mix 10 parts of oil with water and dextrine, stir thoroughly in a porcelain dish until the emulsion is smooth and uniform, and then thin with sufficient water to make a total of 100 parts. Because of the chemical similarity, dextrine is approximately equivalent to gum arabic in this process.

Digest from "Using Dextrine Instead of Gum Arabic in Making Fatty Oil Emulsions," by T. D. Afanas'ev, *Farmatsiya* **2–3**, 28, 1940 (Published in Russia).

Refining Edible Oils

OILS, fats and fatty acids are bleached and purified by treatment with a small proportion (not over 0.5 per cent) of a finely powdered dry compound of a metal. The compound may be either an oxidizing agent or a reducing agent. As the process is disclosed in Holland Patent Application 80,683 (filed Dec. 31, 1936, by E. Kellens of Brussels, Belgium) the oil is first dried and the powdered oxidizing or reducing agent is thoroughly stirred into the oil. This causes no change in the fatty or hydroxy-fatty acid content. Stirring is continued until the color ceases to change, after which a small amount (not over 0.2 per cent) of a concentrated inorganic acid such as hydrochloric or sulphuric acid is stirred in. Stirring is then continued as long as the condition of the oil seems to require (from 1 to 4 hours). At the end of this time the oil is moderately heated, a filter aid is added and the oil is filtered. The filtrate is a clear, pale oil in which nonfatty impurities have been removed while the fatty acids have been retained.

FERMENTATION PRODUCTS

Vinegars From Dried Fruit

ACCORDING to Swiss Patent 203,020 (granted May 16, 1939, to Hans Mostny, Zurich), vinegar with more than 5 per cent acetic acid can be made from dried or partially dried fruits. The fruit is first subjected to alcoholic fermentation until the alco-

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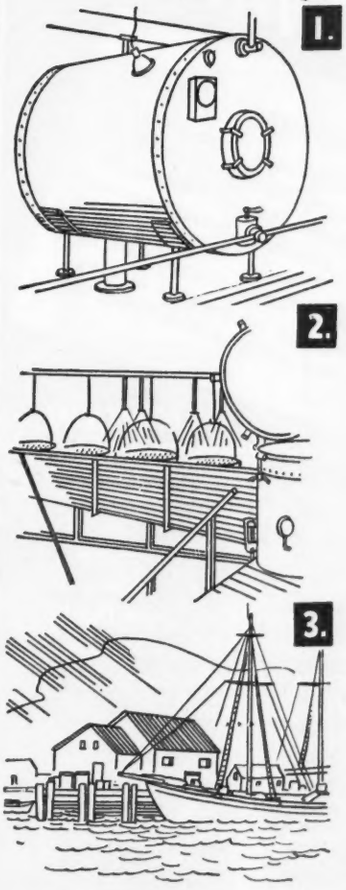

1. Keeping milk storage tanks, tank trucks, tank cars, etc. sweet and germ-free is a job for which dependable chlorine sterilizers like HTH Products are ideally suited. No danger of expansion strains, no breakage (of glass-lined tanks), no loss of time in allowing equipment to cool—as when steam sterilization is used.

2. In canneries, the tiniest imperfection in cans may result in contamination of the product by the water in cooling equipment. Cooling water should therefore be kept safe by maintaining a constant residual of available chlorine in the water. HTH Products contain available chlorine in convenient form ranging in concentration from 15% to 70%.

3. Sanitation problems in the fish industry fall naturally into three divisions—(1) purification of plant water supplies, (2) disinfecting and deodorizing containers and equipment, and general plant sanitation, and (3) disinfecting and deodorizing wharves and the decks and holds of fishing vessels. For all these uses, HTH Products offer a convenient means of effective sanitation.

Dairies, canneries—any and all plants that deal with perishable products—face the same hazard of heavy financial loss due to bacterial contamination.

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hol concentration is higher than would be obtained from the ordinary pressed fruit juice. Instead of being dried, the fruit may be dewatered by freezing. Alcoholic fermentation is followed by acetone fermentation, which gives acetic acid in the specified concentration.

Fermentation Citric Acid

AS AN IMPROVEMENT in the production of citric acid by fermentation, a reagent which destroys vitamins is added to the mash prior to starting the fermentation, and the hydrogen ion concentration is properly adjusted, in order to increase the yield of citric acid. As the invention is described in German Patent 679,847 (granted July 20, 1939, to Dr. Walter K. Lorenz, Frankfort-on-Main) the sugar for fermentation may be derived either from molasses or from whey. The vitamins may be destroyed by generating nascent oxygen in the mash, or a reagent such as a peroxide or catalytically activated hydrogen may be employed for the same purpose. After this treatment, sufficient acid is added to bring the hydrogen ion concentration to the optimum level and the fermentation is started.

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PICKLING

Yeast Fermentation in Cucumber Pickle Making

ANALYSES of cucumber fermentations made over a four-year period (1936-1939) show that under the given conditions yeasts play a part in the fermentations.

A major portion of the fermentations took place in vats of 85-bu. capacity and at a brine temperature of approximately 26.7 deg. C. (80 deg. F.). The salting was done under outside conditions to give brine concentrations of 20, 30 and 40 per cent saturation in respect to salt at 60 deg. F.

Yeast fermentations were found in all brine treatments used. The different salting treatments were found to govern the time of starting and the length of the yeast fermentation period more than they did the number of yeast cells in the brine once the fermentation started.

Fermentation activity in all 20 and 40 per cent saturated brines indicates that the fermentation begins in the weaker brine about five days sooner than in the stronger. However, in general, active yeast fermentation in the 20 per cent saturated brines was of about 15 days duration, while that for the 40 per cent saturated brines was of about 20 days.

Abstract of paper on "The Incidence of Yeasts in Cucumber Fermentations," by John L. Etchells, Food Research Division, Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, Raleigh, N. C.; read before the February, 1940, Technical School for Pickle and Kraut Packers at Michigan State College.

Commercial Mustard Production

IN COMMERCIAL PRODUCTION of mustard, a blend of several varieties of crushed mustard seed, distilled white vinegar (strength 35 to 40 grain), salt and various combinations of finely ground spices are combined according to a given formula, mixed and milled wet. The exact proportion of each ingredient depends partly upon the color and flavor desired in the finished product, and partly upon market conditions.

White mustard seed which contains little or none of the hot, volatile mustard oil is used chiefly in the mild, yellow or French style mustard. Black mustard seed containing this oil in larger quantities (not less than 0.6 per cent) imparts flavor to the highly spiced varieties. Among the spices used are cinnamon, cloves, nutmeg,

ginger, allspice, black and red cayenne and tabasco peppers, bay leaves, celery seed, tumeric, curry powder, thyme and powdered garlic.

In milling, the "finish" depends upon the cut and pressure of the stones, the speed of rotation and the flow rate of the mix.

Small batches of mustard for immediate use are prepared by stirring boiling vinegar, to which salt and spices or spice oils have been added, into mustard flour. In cheap imitation mustards, more or less mustard bran is used as a filler.

Equipment required in a mustard plant includes mixing tanks, pumps, grinding and finishing mills and the usual weighing and measuring devices and labelling machines.

Digest from "The Commercial Production of Prepared Mustard, Table Mustard, and Mustard Dressing," by A. V. Pease. ACE—10. U. S. Dept. Agriculture.

MISCELLANEOUS

Relation of Potato Properties To Products

IN USING POTATOES as raw material, the requirements differ according to the product. For alcohol production, the starch content must be high, saccharification must be easy and disintegration by boiling must be rapid. For edible starch, a high yield of prime starch, white and large-grained, is the first essential. For textile starches, high viscosity of the paste is demanded. For dried potato products, possibility of thorough desiccation and resistance to darkening during the chopping and drying operations are required.

The amylose:amylopectin ratio is an important index of potato quality for alcohol production. Potatoes for edible starch can be judged largely according to the grain size of the starch, and for textile starches according to viscosity of the paste. Certain properties can be influenced by the potato grower; thus darkening of cut slices is diminished by fertilizing with a higher potasssium:nitrogen ratio, namely 2:1 or higher. Climate also has considerable influence.

Data are presented for several named potato varieties on alcohol yields; paste viscosity; rate of saccharification; content of starch, sugar, amylose and amylopectin; grain size; tendency to darken as related to fertilizer composition; and starch yield as related to soil and cultivation conditions.

Digest from "Biochemical Quality Indexes for Potatoes as a Raw Material," by R. P. Nikolaev, *Bulletin de l'Academie des Sciences de l'URSS*, Series biologique, 899 1939 (Published in Russia).

Human Tolerance to Coffee

THE FACT that some people cannot drink coffee is connected at least in part with the presence of emetic substances in coffee. Existence of such substances has been proved by animal tests. The minimum dose of coffee filtrate required to make the test animal vomit averaged 42.5 c.c. per kg. of body weight per 100 g. of roasted but untreated Columbia coffee in each liter of boiling water. Different varieties of coffee show small but distinct differences in emetic action. Thus coffees with a high acid content (e.g., from Costa Rica) have more tendency to cause emesis than do the milder coffees such as Menado. Decaffeinized coffee is indistinguishable from ordinary Columbia coffee in the amount required to cause emesis and in the time elapsing before nausea and emesis appear. Coffee treated by the Lendrich process (superheated steam treatment) loses about half of its emetic action. In pigeons, the emetic dose of coffee is about five times as great per kilogram of body weight as in dogs and is very near the lethal dose of caffeine. The emetic action is

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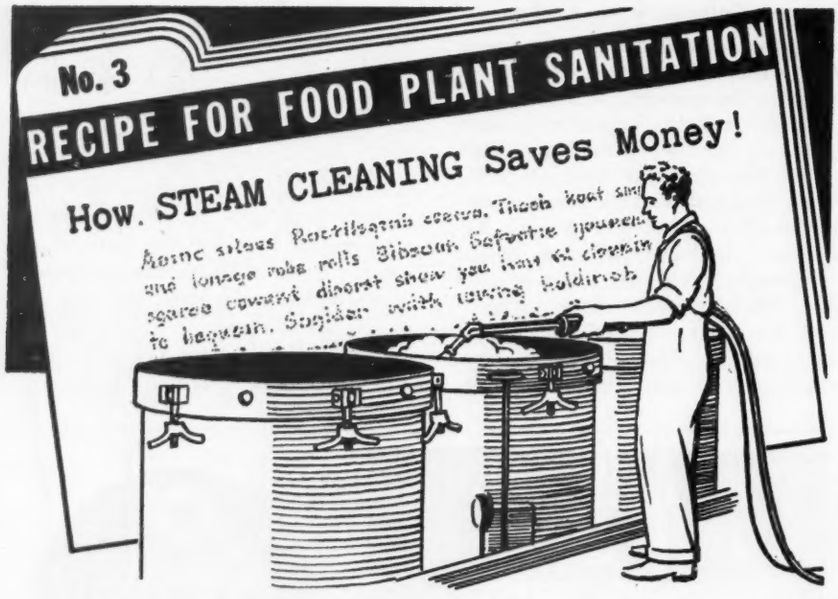

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not due to caffeine since decaffeinizing does not diminish it. In acid medium the emetic substances can be extracted with either but not in alkaline medium.

Digest from "Emetic Substances in Coffee and Their Significance As Related to Coffee Tolerance," by B. Behrens and G. Malorany, *Archiv fur experimentelle Pathologie und Pharmakologie* 194, 269, 1940 (Published in Germany).

Uses of Bacterial Enzymes

MANUFACTURE of enzymes on a large industrial scale by bacterial processes has become an important operation in the fermentation industries, quite apart from the old established use of yeasts. One of the leading applications of bacterial enzymes is in converting starch (from corn, rice, potatoes or cassava) into sugars.

In making distilled liquors, bacterial enzymes eliminate the delicate and expensive malting operations and yet increase the alcohol yield by as much as 10 percent, or even more. In brewing, these enzymes will convert starch to 30 percent of reducing sugars and 70 percent of unfermentable dextrines which are readily hydrolyzed by malt diastase. Among the advantages to the brewer are easier recovery of unconverted starch and better control over cloudiness in beer, whether starch turbidity or protein turbidity.

The bacterial enzymes also have several important industrial uses outside of the food and beverage industries. Among the leading examples are the production of sizing, desizing and dressing compositions for textiles and the manufacture of dehairing agents and other chemicals for tanneries.

Digest from "Industrial Manufacture of Bacterial Enzymes," by Ivan A. Effront, *Chimie et Industrie* 43, 3, 1940 (Published in France).

Delustering Oil-preserved Eggs

ONE of the drawbacks of oil-preserved eggs is their unattractive shiny appearance. According to Canadian Patent 387,429 (granted March 12, 1940, to C. H. Parsons and L. D. Mink, assignors to Industrial Patents Corp., all of Chicago), oiled eggs are easily restored to the nonlustrous appearance of fresh eggs by treatment with a weak acid solution of a wetting agent. Monosodium phosphate is sufficiently acid to give the necessary acidity, and sodium dodecyl sulphate serves excellently as the wetting agent. Accordingly, oil-preserved eggs are delustered by immersing them two or three minutes in water containing 5 to 10 per cent of monosodium phosphate and 0.1 to 0.25 per cent of sodium dodecyl sulphate.

Books

How the British Do It

FOOD INDUSTRIES MANUAL. Published by *Food Manufacture*, 17 Stratford Place, London, W. I. 1940. Distributed by Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y. 232 pages, plus a 79-page bibliography; 8¾x 11 in.; cloth. Price, $4.

Now in the 10th edition, it is the function of this manual to serve as a technical and commercial compendium of British manufacture, preserving, packing and storage of all food products. The publishers have collected what they consider all the information concerning what has become established practice. This information is arranged by industry, product or function for convenient reference.

There are nine sections. I. Wheat, milling, flour, baking, flour confectionery. II. Sugar confectionery, candy, chocolate, jams, jellies. III. Canning and preserving. IV. Meat products. V. Formulas and figures for the dairy industry. VI. Packing, packing materials, containers, packing machinery. VII. Food storage and refrigeration; insulation, air conditioning, etc. VIII. Composition of Foods. IX. Bibliography.

All About Lighting

ARTIFICIAL LIGHT AND ITS APPLICATION. Published by Westinghouse Lamp Division, Bloomfield, N. J. 296 pages, multigraphed; 9x11 in.; paper, spiral binding. Free.

Telling as it does what constitutes proper artificial lighting and how to attain it, this book ought to be in the hands of the management of every factory. Experience has clearly proved the value of good light in industry. It increases production, improves quality, reduces spoilage, curtails accidents, makes for cleanliness and improves morale among workers.

Latest on Biochemistry

ANNUAL REVIEW OF BIOCHEMISTRY. Volume IX. Edited by James Murray Luck. Published by Annual Reviews, Inc., Stanford University P. O., Calif. 1940. 744 pages; 6½x9 in.; cloth. Price, $5.

In this year's edition of the review are several sections of particular interest to the food technologist. These sections include: Biological oxidations and reductions; proteolytic enzymes; chemistry of the carbohydrates and glycosides; the chemistry of amino acids and proteins; fat metabolism; carbohydrate metabolism; fat-soluble vitamins; water-soluble vitamins; biochemistry of the lower fungi; the application of microchemistry to biochemical analysis; nonproteolytic enzymes, and metabolism of proteins and amino acids.

Food Industry Directory

FOOD PRODUCTS DIRECTORY 1940-41. Published by W. J. McCamman, 1202 Hearst Bldg., San Francisco, Calif. 1940. 931 pages; 8x10¼ in.; cloth. Price, $10.

More complete than previous editions, the 1940-41 issue of this directory contains a great deal of information useful to buyers and sellers in the food industries. It Contains directories of canners and packers; manufacturers of dried fruits, nuts, beans, rice and popcorn; freezers and cold packers; wine manufacturers; brewers; food brokers and distributors, and importers and exporters. Then there is a buyer's guide—a classified list of concerns which furnish supplies to canners, packers and shippers. Food brands and labels are also listed.

Malt-beverage Regulation

LABELING AND ADVERTISING OF MALT BEVERAGES. Published by the Federal Alcohol Administration, 1940. 18 pages; 6x9 in.; paper. Price, 5 cents. For sale by Superintendent of Documents, Washington, D. C.

This pamphlet contains regulations on malt-beverage labeling and advertising under the provisions of the Federal Alcohol Administration Act as amended to Jan. 1, 1940. It will be a valuable guide to malt-beverage executives.

Streamlined Commodity Study

COMMODITIES IN INDUSTRY. Published by Commodity Research Bureau, Inc., 82 Beaver St., New York. 1940. 708 pages; 9x11¼ in.; cloth. Price, $7.50.

Here is something new and streamlined in the way of commodity studies. It brings together in one volume information on 75 basic commodities—28 of which are foods. A separate chapter is devoted to each commodity. Each section not only presents vital statistics and prices in chart and tabular form, but it reviews the situation of the commodity for 1939. In addition—and unusual in a book of this type—each section contains a brief description of the sources of the commodity and how it is processed.

Leading off the volume are timely chapters on "War and Commodities," "Trends in Per Capita Commodity Consumption," "Are Synthetics displacing Basic Raw Materials in Industry?", "Weather Forecasting," and "Common Weights and Measures."

Data on Food Composition

PROXIMATE COMPOSITION OF AMERICAN FOOD MATERIALS. By Charlotte Chatfield and Georgian Adams. Published by the U.S. Department of Agriculture. 1940. 91 pages; 6x9 in.; paper. Price, 15 cents; for salt by Superintendent of Documents, Washington, D. C.

The science of "calorie-counting" got its start over 40 years ago when the Department of Agriculture issued the first comprehensive tables on food composition. Now comes a modern version—a new and more comprehensive set of values covering over 1,100 American foods.

Bacteriology for Beginners

APPLIED MYCOLOGY AND BACTERIOLOGY. By L. D. Galloway and F. Burgess. Distributed by Chemical Publishing Co., 148 Lafayette St., New York. 1940. 186 pages; 5¾x8¼ in.; cloth. Price, $4.

A book of this type should be owned and read by every man and woman in the food industries who is not a trained bacteriologist. It is an elementary work designed to give the reader a sound general knowledge of those microorganisms (fungi and bacteria) of special interest to industry.

400 Seafood Recipes

LONG ISLAND SEAFOOD COOK BOOK. By J. George Frederick and Jean Joyce. Published by Business Bourse, 80 West 40th St., New York, N. Y., 1939. 324 pages; 8x5½ in.; cloth. Price $3.

Research departments of fish packing and processing plants can use this cook book, containing over 400 seafood recipes, as a source of ideas and inspiration for new products. Home economists and promotion people might employ the recipes to inform consumers of new and different ways in which to use their companies' products. Public relations men might also find the book of practical value in breaking down resistance some consumers have toward seafood.

The recipes tell how to prepare dishes from oysters, clams, flounder, mussels, eel, crab, lobster, shrimp and scallops. A chapter on how to make sauces for seafoods is of special interest to packers.

Casein Byproduct Production

(*Continued from page 47*)

been predetermined by the manner of precipitation. If the precipitation has been carried out in haphazard fashion there is apt to be plenty of trouble ahead. It is fairly easy to effect improvement in properly precipitated curd by washing; but an improperly precipitated curd, while it can sometimes be improved to the extent that it is acceptable, always results in mechanical handling difficulties. Frequently it has poor drying qualities and occasionally results in substantial losses through being designated by the laboratory as a definitely inferior product. Nevertheless, as is so often the case, careful control in the early stages simplifies operation and control in succeeding stages to a very satisfying degree.

The washing operation must be preceded by as thorough removal of the whey from the curd as is practicable under plant operating conditions. Correctly made curd readily releases its whey in draining and pressing. The curds should present a soft but firm surface as distinguished from either a sticky or tough surface. In order not to appreciably change this physical condition of the curd, the temperature and pH of the wash water must be controlled with almost the same meticulous care that was used in the precipitation, though less damage will be caused by a corresponding amount of variation.

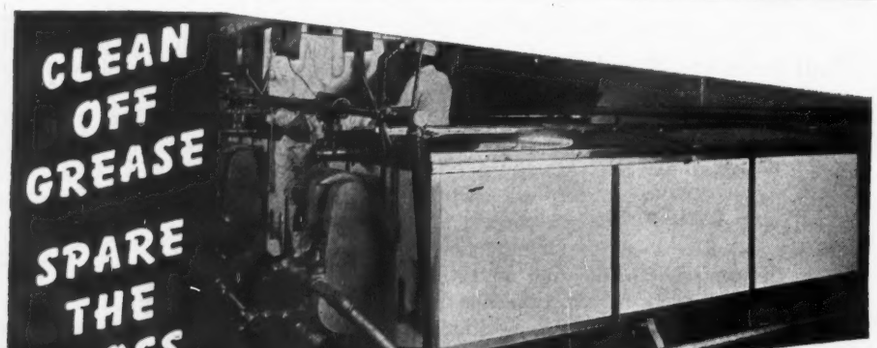
A recording thermometer in the washing vat, or in the line if the continuous process is used, is an excellent method of checking on the control of temperatures and also an easy guide for the operator to follow. It must be remembered that the object of the washing is to remove acid and salts from the curd, principally by dilution of the solution which accompanies it after being drained and pressed. If the surface of the curd particle is toughened, some whey will be imprisoned within and will not be diluted but will be dried with the casein. If the temperature-pH relationship is not kept at the specified point, predetermined to be correct for best results, disaster may follow.

Trouble may take the form of agglomeration of the curd into large, tough masses which are not amenable to thorough washing and will probably be almost unmanageable from the standpoint of mechanical handling. Or, trouble may result in breaking up the curd into very fine particles which, while they might be thoroughly washed, will present as much trouble in handling as the tough agglomerations. In either case, the product is not going to come out as the standard, uniform quality desired. A recording thermometer should most certainly be employed at this point in the procedure.

It is good practice to avoid accumulation of curd at any point in the manufacture. It attracts flies, it sours easily and if left too long will develop mold and eventually begin to decompose. The pressed, shredded curd should be dried as quickly as possible and as rapidly as is consistent with obtaining a dry product, and not discolored by use of too high temperature. Recording thermometers should be installed in the drying chambers, adequate for the guidance of the operators in controlling temperature and for the information of the laboratory in tracing those defects in the finished casein which are due to overheating. Automatic temperature regulating instruments should be employed in the kilns or continuous dryer. Too high temperatures in the initial stages will tend to caseharden the casein, making finished drying difficult. Too high temperatures in the final stages will cause yellowing or even browning of the particles to the great detriment of the product.

Not all casein is ground before shipment to the consumer. When it is sent out as a ground and sized product, the screen analysis is of some concern to the user since too many oversize particles may either increase the length of time he has to allow for complete solution or may result in the fouling of some of his equipment if they remain undissolved. In either event they constitute a black mark against the casein and should be eliminated. Screen analyses in the laboratory will discover these oversize particles and, since they usually indicate a break in the bolting cloth or screen, the condition which produced them can be quickly remedied. An excessive amount of very fine material will also prove objectionable, for it tends to form balls which do not wet on the inside when the casein is being redissolved. Screen analyses, like all other characteristics, should be maintained at a set standard.

Uniformity of product is the thing to strive for. Make one package in a carload representative of the entire carload and one carload representative of a year's production. It will then be safe to say that, while the customer may ask that the product be improved in one characteristic or another from time to time, he will be happy that he does not have to change all his formulas each time he gets a fresh carload of the product.



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Patents

Glyceride Oil Given an Individual Flavor and Odor With Improved Stability Quality by Grinding With Salted, Dehydrated Olives Followed by Removal of Undissolved Olive Solids—Sidney Musher, to Musher Foundation, Inc., New York, N. Y. No. 2,199,364. April 30, 1940.

Sirup for Milk Supplement Made by Concentrating Sugar Cane Juice With Citrus Fruit Juice With Retention of Minerals and Vitamins Present and by Adding Partially Neutralized Citrus Fruit Juice With Acid Content Too Weak to Curdle Milk—Martha R. Jones, San Francisco, Calif. No. 2,199,522. May 7, 1940.

Carbonated Beverages Automatically Held at a Given Gas Content as Drawn From Bulk Container—Edward F. Gamble, Palo Alto and Frank N. Towle, Los Altos, Calif. No. 2,199,661. May 7, 1940.

Yeast Grown in Medium to Which Nutrients Are Added at a Rate Faster Than Yeast Growth During the First Half of the Propagation Period and Slower Than Yeast Growth During the Second Half—George de Beeze, Lawrenceburg, Ind. No. 2,199,722. May 7, 1940.

Citrus Fruit Juice Extracted by Mechanical Means—William O. Brown, Los Angeles, Calif. No. 2,199,876. May 7, 1940.

Grained Confections Made From Supersaturated Solutions of Dextrose and Sucrose—Albert A. Lund, New York, N. Y. No. 2,199,887. May 7, 1940.

Vitamin A Concentrate Made From Oils by High-vacuum Distillation—Kenneth C. D. Hickman, to Distillation Products, Inc., Rochester, N. Y. No. 2,199,995. May 7, 1940.

Tomato Juice Extracted Under Pressure of Helical Screw Operating in a Cylindrical Housing Having Intake and Discharge Openings—Willard C. McNitt, Winnetka, Ill., deceased, to American Utensil Co., Chicago, Ill. Reissue No. 21,449. April 14, 1940.

Oils and Fats Hydrogenated to High Degree of Saturation and Saponified Initially in Separate Steps to a Partial Stage and Thereafter Jointly in Same Apparatus for Production of Fatty Acids—Hans Kaufman, Munster, Westphalia, Germany. No. 2,200,279. May 14, 1940.

Berries Quick Frozen While Passing Through a Unit Consisting of a Vertical Rotating Shaft Carrying a Series of Refrigerated Plates Onto Which the Berries are Progressively Deflected During Their Downward Passage—Alan R. Fisher, New York, N. Y. No. 2,200,331. May 14, 1940.

Pies Made on a Continuous Operating Unit Consisting of an Odd Number of Pie Plate Holders, a Rotating Crust Moistening Brush, a Rotating Crust Trimmer and a Circuitous Conveyor—Dennis W. Smith, to Colborne Mfg. Co., Chicago, Ill. No. 2,200,347. May 14, 1940.

Milk, Beer and the Like Subjected to Temperature Changes During Passage Through Vertical Heat Exchange Unit Assembled in Fan-like Relation to Each Other—Fritz G. Cornell, Jr., Mountain Lakes, N. J., to Jensen Creamery Machinery Co., Inc., Bloomfield, N. J. No. 2,200,355. May 14, 1940.

Water Cooled During Passage Through Heat Exchange Plate Made of Two Identical Sheet-metal Stampings Having Outside Mating Flanges Welded Together—Edward G. Lehman, to York Ice Machinery Corp., York, Pa. No. 2,200,426. May 14, 1940.

Butter Made and Worked in a Cast Metal Churn Incapable of Affecting Flavor of Butter Under Normal Conditions—Clyde L. Mitchel, El Monte, and Elbert L. Wetmore, Alhambra, Calif., to Challenge Cream & Butter Association, Los Angeles, Calif. Nos. 2,200,513 and 2,200,514. May 14, 1940.

Cocoa Butter Polymerized and Strongly Oxidized to Give a Low Iodine Value—William Clayton, Sydney Back, James Frederick Morse and Robert Ian Johnson, to Cross & Blackwell, Ltd., London, England. No. 2,200,858. May 14, 1940.

Ice Cream Cone Made From Chocolate Candy—George Winter Kennedy, Philadelphia, Pa. No. 2,200,956. May 14, 1940.

Egg White Whipped to a Foam and Dried in Strand Form—Leon D. Mink, to Industrial Patents Corp., Chicago, Ill. No. 2,200,963. May 14, 1940.

Oils and Fats Having Fatty Acid Base Containing More Than Two Double Bonds Stabilized by a Vegetable Phosphatide Containing Not More Than Two Double Bonds in Its Fatty Acid Radical—Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev. No. 2,201,061. May 14, 1940.

Shortening for Bakery Goods Carrying High Sugar Content Made From Oils Mixed With Small Quantity of Vegetable Phosphatide Having Not More Than Two Double Bonds in Fatty Acid Radical—Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev. No. 2,201,063. May 14, 1940.

Dessert and Confection Products Made to Contain a Small Quantity of Vegetable Phosphatide Free From Fatty Acids Radicals Having More Than Two Double Bonds—Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev. No. 2,201,064. May 14, 1940.

Hydrogenated Shortening Treated With a Small Quantity of Macerated Sesame Seeds to Assure Desirable Flavor and Odor Properties and Improve Frying and Baking Characteristics—Sidney Musher to Musher Foundation, Inc., New York, N. Y. No. 2,201,112. May 14, 1940.

Doughnuts Carried Through a Deep Fat Cooker by Mechanically Induced Flow of Cooking Liquid—Charles E. Carpenter, Badger, Minn., to Challenger Do-Nut Machine Corp. Reissue No. 21,457. May 21, 1940.

Gelatin Made From Animal Tissue Involving Addition of a Non-tertiary Amine Having No Negative Group and an Alkaline Earth Metal Halide During the Liming Treatment—John Vernon Stuart Glass, Sutton Weaver, near Warrington, England to Imperial Chemical Industries, Ltd. No. 2,201,168. May 21, 1940.

Sucrose Recovered From Filter Press Cake by Washing With Solution of Alcohol and Water Adjusted to Alkalinity of Treated Mother Liquor Prior to Filtration—William H. Young, Burlingame, Calif. No. 2,201,419. May 21, 1940.

Sausage and Similar Meat Product Casings Made to Consist of a Tube of Paper With a Continuous Moisture-proof Lining of Rubber Hydrochloride—John Paul Smith and William Franklin Henderson to Visking Corp., Chicago, Ill. No. 2,201,457. May 21, 1940.

Lard Stabilized Against Rancidity by Mixing With Hydrogenated Refined Soya Oil—Donald P. Grettie, to Industrial Patents Corp., Chicago, Ill. No. 2,201,692. May 21 1940.

Chocolate Liquor Mixed With Water at Temperature Above Melting Point of Cocoa Butter, Emulsified Into Fine State of Division and Dried For Removal of Added Water—Paul T. Zizinia, Belmar and Thomas L. McKenna, Newark, N. J. No. 2,201,820. May 21, 1940.

Yeast Fermentation of Maltose Speeded Up by Addition of 0.33 to About 7.0 Percent of Dextrose—Alfred S. Schlutz and Lawrence Atkin, Bronx, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,202,356. May 28, 1940.

Heavy Cuts of Meat Enclosed in Air Tight Bags With an Air Tight Socket Adapted to Receive a Hanging Hook—Gordon E. Goff, to Dewey and Almy Chemical Co., North Cambridge, Mass. No. 2,202,375. May 28, 1940.

Coffee Characteristics Determined by Quantity of Oxygen Absorbed Under Controlled Time, Humidity and Temperature Conditions—William Redmond Johnston, Bronx, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,202,385. May 28, 1940.

Powdered Food Products Cooled During Passage Along an Inclined Encased Plate Formed From a Plurality of Strips of Heat Conducting Sheet Metal Fastened Together at the Side Edges and Having Radiating Fins Projecting Down Into Passage Through Which Passes Cold Air—Carl H. Leaf, Luck, Wis., to Land O'Lakes Creameries, Inc., Minneapolis, Minn. No. 2,202,498. May 28, 1940.

Salt Measured Loosely in Accurate Quantities by Machine Having a Heated Hopper to Keep Salt Free Flowing—Harvey Lee Bird, Ann Arbor, Mich. Reissue No. 21,453. May 21, 1940.

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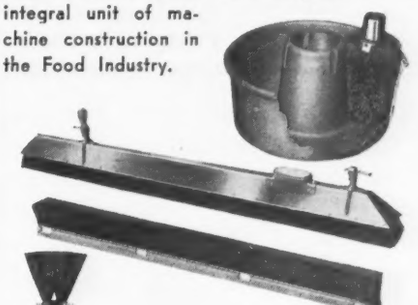

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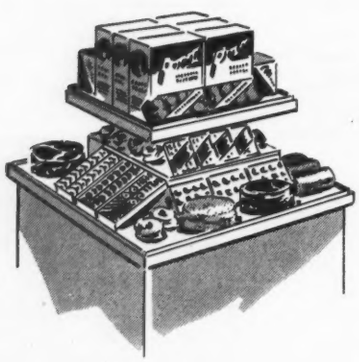

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Accordingly, the Winthrop Chemical Company, outstanding pharmaceutical manufacturer, through its new Special Markets Division, now offers "Crystalline B_1 Winthrop."

Many foods in the modern diet are naturally lacking in B_1 content, and some foods possessing higher potency in their raw state lose much of it during necessary processing operations. The addition of vitamin B_1 to many such deficient foods is both practical and economical.

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Write for prices and information about "Crystalline B_1 Winthrop" — also Vitamin C.

WINTHROP

VITAMIN B_1

(THIAMIN CHLORIDE)

SPECIAL MARKETS DIVISION

WINTHROP

CHEMICAL COMPANY, INC.

170 VARICK STREET, NEW YORK, N. Y.

Formulas for Foods

FORMULA NO. 101

Date Nut Bread—
Date Nut Pudding

(Suitable for canning, or for open pan baking and cellulose wrapping.)

Mix together:

Dates (cut in half)	**8 lb.**
Warm water (variable)	**12 lb.**
Nut Meats	**2 lb.**
Soda	**6 oz.**

Add and mix:

Melted Butter or Shortening	**1 lb.**
Sugar (Sucrose)	**5 lb.**
Salt	**2½ oz.**
Best Grade Molasses	**5 lb.**

Add, and mix in, smooth:

Flour (blend or part whole wheat, oatmeal or soy, if desired)	**10 lb.**

Adjust moisture for medium stiff dough. For pudding type, add more water.

Note: For a lighter, more fluffy loaf, add 1 to 2 oz. baking powder with flour.

Bake in heavily buttered, paper bottom, loaf pans or cups. Bake at 350 deg. F. with a little steam.

For special handling in canning and sterilizing in retorts, write Parker-Broeg, Boston.

Formula from Parker-Broeg

FORMULA NO. 102

Butterscotch Cream Base

(For butterscotch pie, pudding, etc.)

Blend well together:

Brown sugar (No. 8 or 9)	**20 lb.**
Salt	**5 oz.**
Butter, melted	**2 lb. 8 oz.**
Carmel or butterscotch	**5 oz.**
Vanilla (16 concentrate)	**½ oz.**

Add and blend:

Cornstarch (best grade, acid free) (amount variable)	**4 lb.**
Bread flour (variable)	**4 lb.**

Pack in containers for use.

By mixing in the order given, the mass should be smooth, and it should not be necessary to pass it through a coarse sieve to make sure the lumps are even and uniform.

To use this preparation, bring to boil:

Fresh milk, liquid	**1 gal.**

When hot, place one-fourth of this milk in a separate, round bottom vessel.

Place the previously given preparation in this hot milk and work to a smooth paste. Stream the paste slowly into the other 3 qt. of milk while it is boiling. Whip vigorously with a wire whip. Make sure that it does not scorch. Stir constantly during cooking. As soon as the mass is thoroughly cooked, shut off the heat.

The batch of dry blend may be made up beforehand in large quantities in the blender or a dough mixer. Set aside until ready for use. Then weigh out the required quantity and proceed.

Formula from Parker-Broeg, Boston.

READER COMMENT

To the Editor:

RE FORMULA NO. 81

Formula No. 81 given on page 104 in the June, 1940, FOOD INDUSTRIES describes a method for manufacturing strawberry-flavored sirup. We wish to comment on the suggestion given therein for using strawberry sirup left behind after withdrawing the fruit. This procedure in principle would be considered wrong by the Food and Drug Administration, since a preserve would therefore be manufactured with part of the strawberry ingredient removed. Then again, the chemical examination of the preserve thus made would probably show up as a substandard product. Cold pack fruits, when allowed to thaw out, must be used in their entirety for making preserves.

RE FORMULA NO. 83

Formula No. 83 for Worcestershire Sauce given on page 104 of the June, 1940, FOOD INDUSTRIES calls for the use of acetic acid. It is our opinion that inclusion of acetic acid would constitute a violation of the food law.

Very respectfully yours,
S. BLUMENTHAL
Shirley Research Chemists

FOOD INDUSTRIES is very grateful to Mr. Blumenthal for calling attention to two potential sources of violation of food law.

In the case of the formula for Worcestershire Sauce, the use of acetic acid can be avoided by employing distilled vinegar and cutting down the amount of water proportionally. It should be noted, however, that this is a British formula and that in England dilute acetic acid is legal.

But in the case of formula No. 81 for strawberry-flavored sirup, the problem is not directly with the sirup but with the preserve that would be made with the sirup removed. In view of the new definition and standard of identity for preserves, such a preserve would be decidedly at variance with the new standards.

—the EDITORS.

FORMULA NO. 103

Fudge (cheap)

Unit	Ingredients	Test Batch	Production Batch
A	**Sugar**	1½ lb.	15 lb.
	Dry milk solids[1]	5 oz.	3 lb.
	Water	7½ oz.	5 lb.
	Stabilizer	2½ grams	1 oz.
B	**Corn sirup**	1½ lb.	15 lb.
C	**Fondant** (See Formula No. 24)	8 oz.	7 lb.
D	**Salt**	to taste	
	Vanilla	to taste	
	Cocoa powder	to taste	

[1] Contain not more than 1½ per cent butter fat and not over 5 per cent moisture.

Method

Mix the sugar, dry milk solids and stabilizer, (CaO, $NaNO_3$, Na_2CO_3, $(NH_4)_2CO_3$ or MgO). Then gradually add the water, making the mass into a paste, then into a semi-liquid. Bring to vigorous boil, then add B.

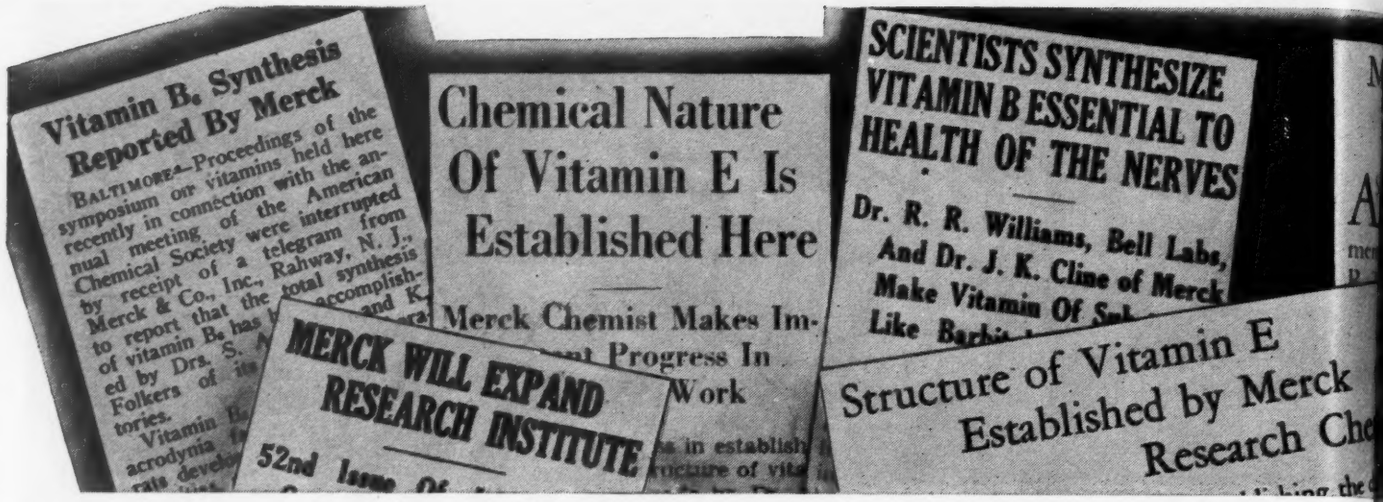
Cook A and B to 245 deg. F. Take off fire, cool somewhat, and add C. Cream and mix in thoroughly.

Add the salt and vanilla. If chocolate flavor is desired, cocoa powder may be used. When batch reaches about 120 deg. F., it can be poured on oiled or greased (slab oil) paper.

This formula can be varied by adding more or less dry milk solids.

This formula may be further varied

(Turn to page 102)


Vitamin B₆ Synthesis Reported By Merck
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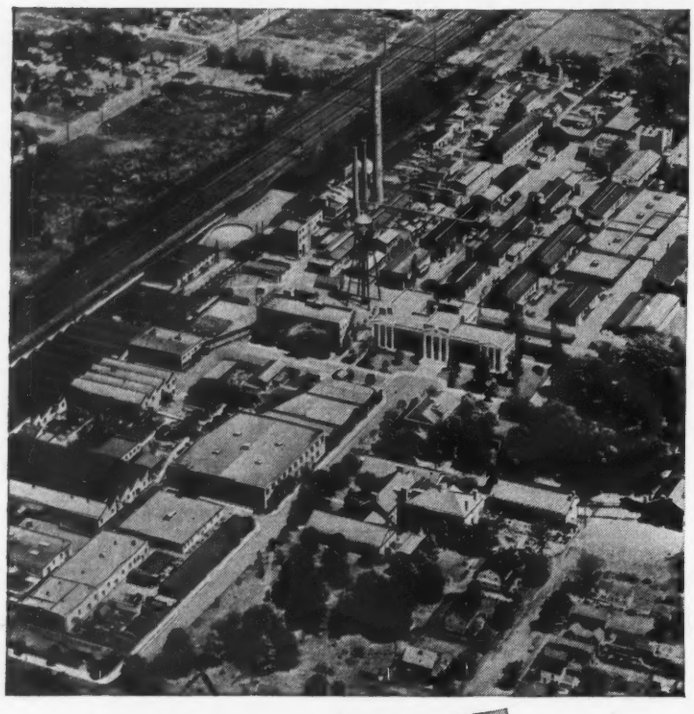
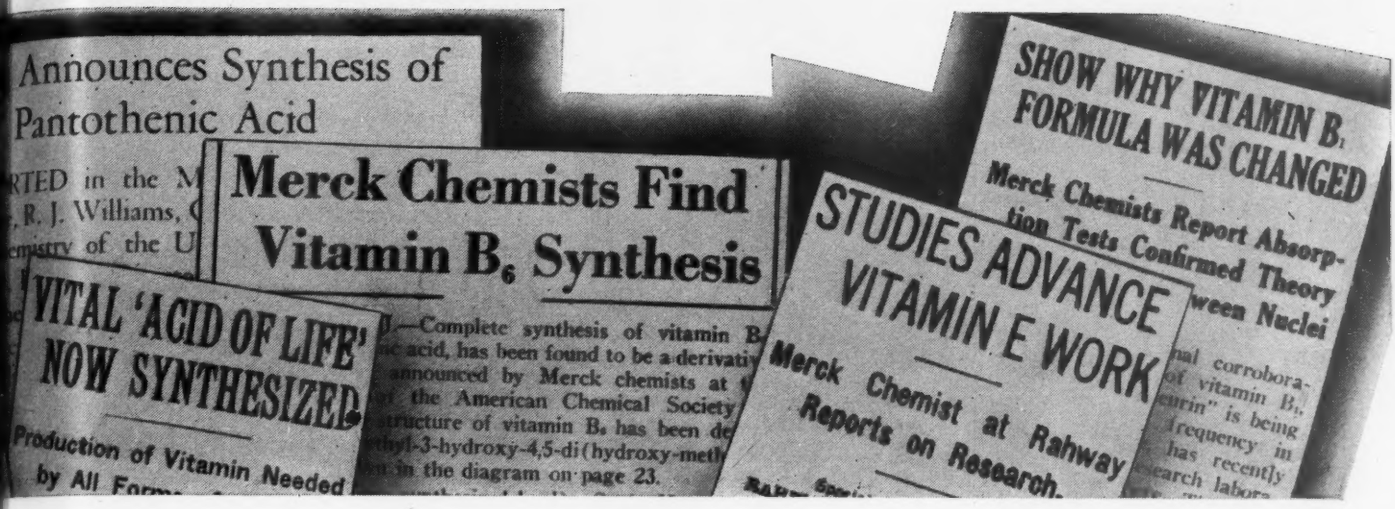
Merck Chemist Makes Important Progress In Work
MERCK WILL EXPAND RESEARCH INSTITUTE
52nd
SCIENTISTS SYNTHESIZE VITAMIN B ESSENTIAL TO HEALTH OF THE NERVES
Dr. R. R. Williams, Bell Labs, And Dr. J. K. Cline of Merck Make Vitamin Of
Structure of Vitamin E Established by Merck Research



MERCK

PIONEERS IN THE SYNTHESIS AND PRODUCTION OF PURE CRYSTALLINE VITAMINS

MERCK & CO. Inc. *Manufacturing Chemists* RAHWAY, N. J. · New York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With vitamins commercially available in pure crystalline form, it is now economically and technically practicable for the manufacturer to restore or fortify the vitamin content of his products. By using the pure crystalline vitamins, troublesome problems of color, odor, taste, and bulkiness are completely eliminated.

Merck offers valuable technical assistance in the restoration and fortification of your products with crystalline Vitamin B_1. Our technical staff and laboratories are prepared to render service on such important factors as adequate distribution and retention of the vitamin, and product control methods. Why not call us in today and learn how easily and economically pure crystalline Vitamin B_1 can be incorporated in your products.

Write for the recently prepared brochure, "The Use of Crystalline Vitamin B_1 in Foods."

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Other pure crystalline vitamins manufactured by Merck are:

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Ascorbic Acid (Vitamin C)
Nicotinic Acid
Nicotinamide
Vitamin B_6

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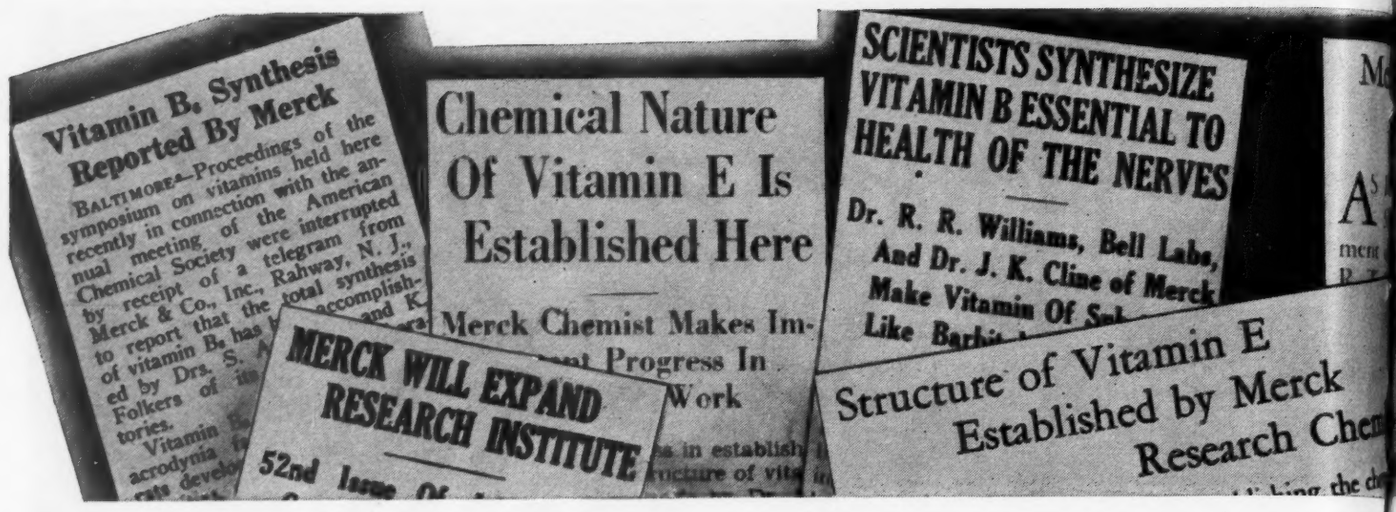
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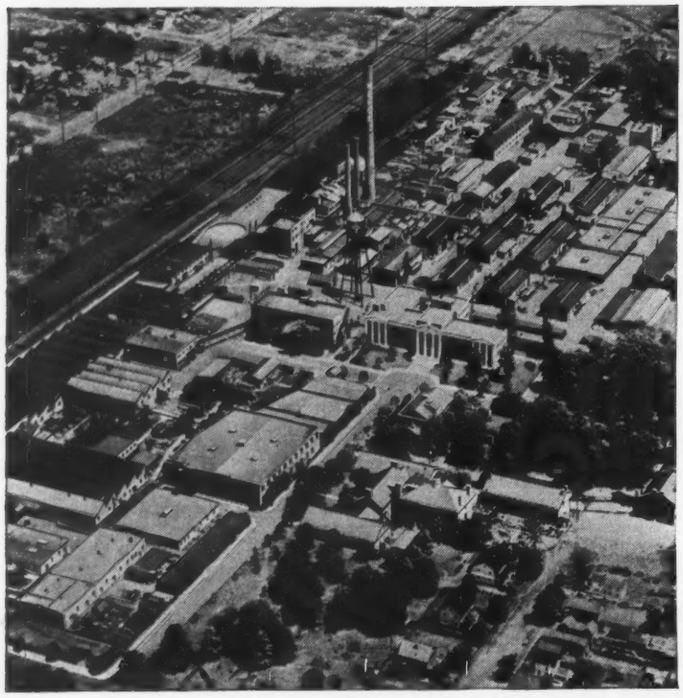

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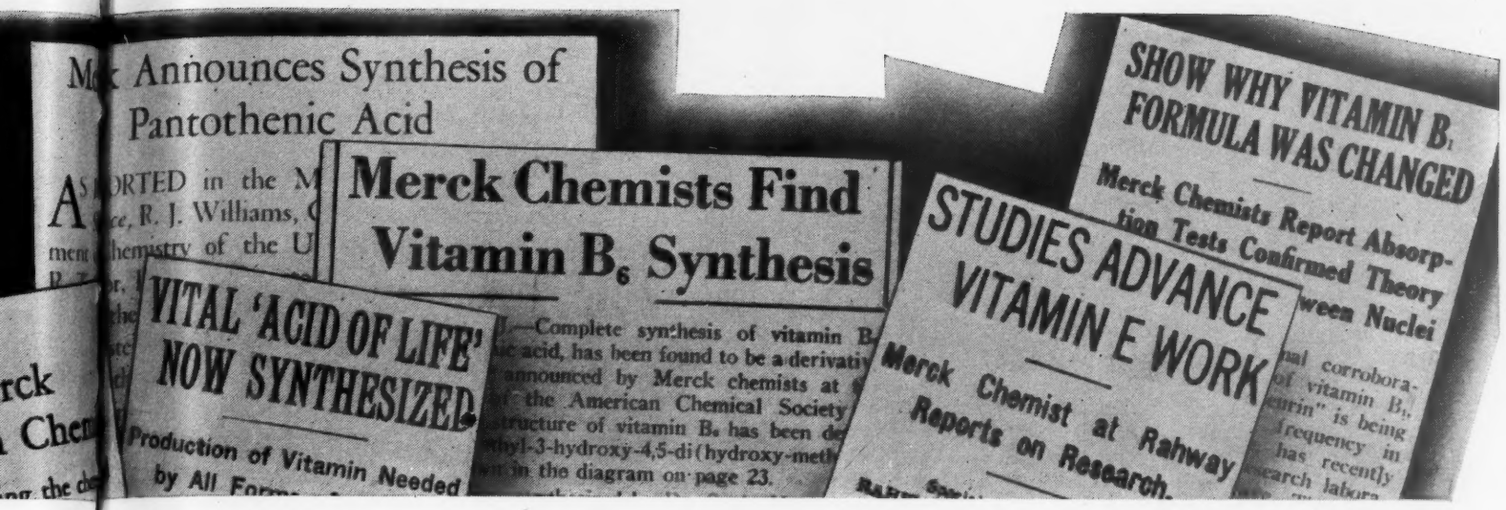
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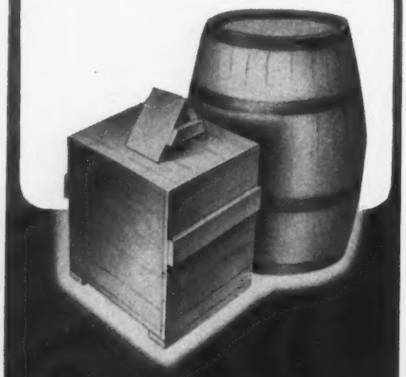

E. I. DU PONT DE NEMOURS & CO.
INCORPORATED
GRASSELLI CHEMICALS DEPARTMENT
WILMINGTON DELAWARE

DU PONT

(Continued from page 99)

by adding less corn sirup. The less corn sirup, the lower the temperature to which the batch is cooked.

FORMULA NO. 104

Worcestershire Sauce
No. 2

West Indian tamarinds (pulped)	**20 lb.**
Montserrat limes	**10 lb.**
East Indian capsicum	**10 lb.**
West Indian preserved ginger	**10 lb.**
Sweet, sliced mango chutney	**10 lb.**
Garlic	**1 lb.**
Sugar	**10 lb.**
Salt	**5 lb.**
Cassareep juice	**10 gal.**
Indian black soy sauce	**1 gal.**
Sour sherry wine	**4 gal.**
Lemon juice	**6 gal.**
Brine from capsicums	**4 gal.**

Pass the limes, capsicums, ginger, chutney and peeled garlic separately through a mincing machine and weigh out according to formula above. Boil the tamarinds with the brine in a pan (steam-jacketed kettle) and pass through a pulping machine to remove stalks and stones. Then return to pan.

Dissolve the sugar in the lemon juice and pass through a fine sieve.

Simmer all the ingredients for an hour.

Pass through a flat stone mill and then through a fine sieve.

Fill into bottles from a stirring vat.

Formula from H. B. Cronshaw, London, England

FORMULA NO. 105

Angel Food Make-Up, Using Dry Mix

Place in machine bowl:

Egg whites	**30 lb.**

Beat until the marks of the whip are showing. Do not overbeat.

Add slowly while continuing to beat:

Sugar, granulated (sucrose)	**15 lb.**
Cream of tartar	**8 oz.**

Add last and mix in enough to distribute well:

Angel food dry mix. 27 lb.	**4½ oz.**

(See Formula No. 86)

Deposit in pans. Bake and handle as usual for angel cake.

FORMULA NO. 106

Garlic Vinegar

Fresh garlic, chopped fine.	**15 lb.**
Vinegar, distilled, 100 grain	**43 gal.**

Place in a clean, tight, paraffined 45 gal. barrel.

Age for 30 days.

This garlic vinegar is for use in "koshering" genuine dill pickles. Add 1 fluid ounce to each 45 gal. barrel of repacked dills to get a mild garlic flavor. More can be added to obtain a stronger flavor.

See FOOD INDUSTRIES, March, 1940, page 50, for full working directions.

Formula from W. G. Wormley

FORMULA NO. 107

Cheese Cake

Roll out piece of basic sweet dough (Formula 27, 45 or 46) to fit a bun pan; about 2½ lb. Pinch edges of the dough up around the sides of the pan. Dock or prick well to prevent blistering.

Proof dough to twice original volume. Pour in cheese filling. Sprinkle cinnamon on top and bake at medium heat (300 to 350 deg. F.).

See Formula 37 for cheese filling.

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